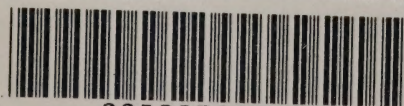




12-2-60
C 208



22500388005



INTERNATIONAL MEDICAL MAGAZINE.

AN ILLUSTRATED MONTHLY, DEVOTED TO

MEDICAL AND SURGICAL SCIENCE.

EDITED, UNDER THE SUPERVISION OF

JOHN ASHHURST, JR., M.D., LL.D., AND JAS. T. WHITTAKER, M.D., LL.D.,

Barton Professor of Surgery and Professor of Clinical Surgery in the University of Pennsylvania;
Surgeon to the Pennsylvania Hospital, etc.,

Professor of the Theory and Practice of Medicine
in the Medical College of Ohio,

BY

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Pathologist to the
Presbyterian Hospital; Coroner's Physician of the City of Philadelphia, etc.

VOL. V.

PHILADELPHIA, PA.:

INTERNATIONAL MEDICAL MAGAZINE CO., PUBLISHERS,

716 FILBERT STREET.

NEW YORK: 144 EIGHTH STREET.

LONDON: 10 HENRIETTA STREET, COVENT GARDEN

1897.

Copyright, 1896-97, by INTERNATIONAL MEDICAL MAGAZINE COMPANY.

WELLCOME INSTITUTE LIBRARY	
Coll.	WelMOMec
Coll.	
No.	

PRINTED BY J. B. LIPPINCOTT COMPANY, PHILADELPHIA.



INTERNATIONAL MEDICAL MAGAZINE.

CONTRIBUTORS TO VOL. V.

- | | |
|--|---|
| ABBE, ROBERT, M.D., of New York. | GOODSPEED, ARTHUR W., Ph.D., of Philadelphia. |
| ASHHURST, JOHN, JR., M.D., LL.D., of Philadelphia. | HERSMAN, C. F., M.D., of St. Louis. |
| ASHHURST, WILLIAM W., M.D., of Chihuahua. | HINSDALE, GUY, A.M., M.D., of Philadelphia. |
| BABCOCK, R. H., M.D., of Chicago. | INGALS, E. FLETCHER, A.M., M.D., of Chicago. |
| BECK, CARL, M.D., of New York. | JOURDAN, MAURICE, M.D., of Marseilles. |
| BELL, ROBERT, M.D., F.F.P.S.G., of Glasgow. | KEEN, W. W., M.D., of Philadelphia. |
| BONDURANT, E. D., M.D., of Tuskaloosa. | KING, CLARENCE, M.D., of Machias. |
| BOWDITCH, VINCENT Y., M.D., of Boston. | KNIGHT, FREDERICK I., M.D., of Boston. |
| BOWEN, CUTHBERT, M.A., M.D., F.R.M.S., of Barbados. | KRAMER, DR., of Cincinnati. |
| BURRELL, HERBERT L., M.D., of Boston. | LYON, H. N., M.D., of St. Louis. |
| CATTELL, HENRY W., A.M., M.D., of Philadelphia. | MAGILL, WILLIAM S., M.D., of Paris. |
| COLLINS, JOSEPH, M.D., of New York. | MORTON, THOMAS G., M.D., of Philadelphia. |
| CROUCH, H. C., M.D., of Denver. | MULHALL, J. C., M.D., of St. Louis. |
| CUMSTON, CHARLES GREENE, B.M.S., M.D., of Boston. | MUNRO, JOHN C., M.D., of Boston. |
| CURTIN, ROLAND G., A.M., M.D., Ph.D., of Philadelphia. | MURPHY, JOHN B., A.M., M.D., of Chicago. |
| DEJERINE, PROFESSOR, of Paris. | MUSSER, J. H., M.D., of Philadelphia. |
| DEJERINE, MADAME, of Paris. | OLIVER, CHARLES A., A.M., M.D., of Philadelphia. |
| DUDLEY, WILLIAM F., M.D., of Brooklyn. | OSLER, WILLIAM, M.D., F.R.C.P. (Lond.), of Baltimore. |
| FRIEDENWALD, JULIUS, A.B., M.D., of Baltimore. | PARK, ROSWELL, M.D., of Buffalo. |
| GIBSON, W. M., M.D., of Utica. | RANSOHOFF, DR., of Cincinnati. |
| | RIGGS, C. EUGENE, A.M., M.D., of St. Paul. |

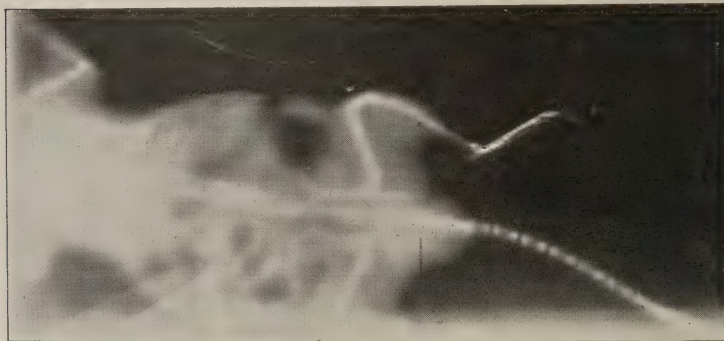
- | | |
|---|--|
| ROBERTSON, J. STEELE, Esq., of Melbourne. | TAYLOR, A. E., M.D., of Philadelphia. |
| ROBINSON, W. D., M.D., of Philadelphia. | TAYLOR, JOHN MADISON, A.B., M.D., of Philadelphia. |
| SEILER, CARL, M.D., of Philadelphia. | THOMAS, J. D., M.D., of Pittsburg. |
| SPILLER, WILLIAM G., M.D., of Philadelphia. | TUSSEY, A. EDGAR, M.D., of Philadelphia. |
| STEELE, J. DUTTON, M.D., of Philadelphia. | VANDER VEER, ALBERT, M.D., of Detroit. |
| STELWAGON, HENRY W., M.D., of Philadelphia. | WATHEN, WM. H., A.M., M.D., of Louisville. |
| STOCKTON, CHARLES G., M.D., of Buffalo. | WHITTAKER, JAMES T., M.D., LL.D., of Cincinnati. |

FIG. 1.



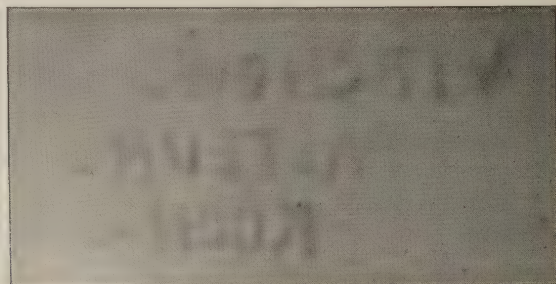
Human hand skotographed by exposure to a Crookes tube for one and a quarter hour

FIG. 2.



Portion of a mouse. A positive was prepared, and the half-tone cut has been made from this.

FIG. 3.



The words have been written with chromate of lead oil-paint on an ordinary visiting card; this was placed on eight thicknesses of orange photographic paper, and then skotographed. The name printed on the card in printer's ink does not appear, while the other words are of course reversed.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

FEBRUARY, 1896.

[No. 1.

ORIGINAL COMMUNICATIONS.

RÖNTGEN'S DISCOVERY AS APPLIED TO MEDICINE.¹

BY HENRY W. CATTELL, M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania.

THE discovery by Röntgen,² professor of physics in the University of Würzburg, of a peculiar form of energy, marks a new era in practical medicine, for we are now able by this process to produce pictures of bones and certain other substances, such as glass, bullets, and pins, when covered over by the soft tissues of the living body. The imagination of the reader will at once suggest the manifold uses to which such pictures can be put, and, according to the accounts in the daily papers and from our own experiments, results have already been obtained but little expected even a few months ago. The process of taking a *skotograph* (σκοτός, darkness), so called in contradistinction to a *photograph* (φῶς, light) or a *skiagraph* (σκία, a shadow), is very simple; in fact, so easy of accomplishment that, now the process being known, one wonders, as is often the case in similar instances, why it has not been discovered before.

The technique is as follows: An ordinary photographic plate is introduced into a *wooden* plate-holder,³ which in turn is placed upon a firm table. The hand or other object to be skotographed is now rested upon the

¹ Paper read before the Philadelphia Pathological Society, February 13, 1896.

² I have references, not yet verified, which show that the passage of rays from a Geissler's tube through wood was known earlier than 1887.

³ Or the plate may be wrapped in several thicknesses of orange or black paper.

plate-holder,¹ and a Crookes tube² is arranged from three to five inches above the object, so that the x- or cathodic rays will fall perpendicularly upon the object. An ordinary Ruhmkorff coil and several cells are sufficient to supply the electrical current, though a higher frequency current is better, as the time of the exposure can thus be materially lessened. In the physical laboratory of the University of Pennsylvania, where, through the kindness of Professor Arthur W. Goodspeed, experiments have been carried on by the writer, the length of time has been an hour or more, while in other places with more perfect apparatus even four and a half minutes have sufficed. Such apparatus will be, however, set up in the course of a few days. After exposure the sensitized plate is developed by any of the ordinary methods, and prints can then, of course, be prepared from the negative. In the frontispiece will be seen several untouched half-tone reproductions of skotographs taken from among the objects first employed by the writer, and others may be found in the *Medical News* of February 15.

It would indeed be interesting to see a skotograph of the entire human body, though difficulty will be met with in those places where the shadow of one bone will be cast upon another, the bones being at different distances and planes from the sensitized plate. Edison is trying to overcome this by fixing numerous places from which the x- rays will emanate. The superimposing of the skotograph upon the photograph, the latter possibly in color, would certainly make a novel and instructive picture, especially if an anaglyphic effect could be produced at the same time.

I have seen the fresh specimens from two post-mortems where an unsuspected jack-stone was lodged in the larynx. As the tissues here are capable of being skotographed by the apparatus already at our command, the laryngologist has a new instrument which he can use for such purpose.

In regard to the preparation of pictures from morbid growths it may be expected that even here the new discovery will be of some use, as the intensity of the shadow due to the different thickness of the tissue through which the rays will act may be shown up in the plate. Thus an absent or horseshoe kidney, an abscess, or a tumor might possibly be discovered. Perhaps it can be told when the hip-joint has become fixed in coxalgia.

The sad part attached to a new discovery such as this is the false hopes that will be raised among the laity from the newspaper reports, as the increase in our means of diagnosis has always kept far in advance of treatment, unless of a surgical nature. The last mail brought a letter in which

¹ If the plate-holder is perfect, the room need not be darkened.

² See any work on physics, or an encyclopædia.

a mother grasps at the false hope that her daughter will be benefited by skotography. She writes, "I have a daughter twenty-five years old who has suffered from epilepsy induced by scarlet fever for twenty-one years, with partial paralysis of the left side. Her mind has been somewhat disturbed, and last summer she was taken to the asylum. . . . Would it be possible to locate the brain difficulty with the new discovery?"

From our present knowledge it would therefore seem—

1. That a new means of medical diagnosis has been added by Röntgen to the already large list at our command.
2. The discovery will prove especially valuable in diseases of the bones, more particularly if these are of a surgical nature.
3. Many new uses for skotography will be discovered as time goes on, the process will be amplified, the shadow brought to a focus, etc.

ON SIX CASES OF ADDISON'S DISEASE, WITH THE REPORT OF A CASE GREATLY BENEFITED BY THE USE OF THE SUPRARENAL EXTRACT.

BY WILLIAM OSLER, M.D., F.R.C.P. (LOND.),
Professor of Medicine, Johns Hopkins University.

NINE cases of this rare affection have fallen under my observation. In two of these I made the dissection of the nerves and capsules.¹ A third case I reported in conjunction with Dr. J. C. Wilson in volume xiii. of the *Transactions of the Philadelphia Pathological Society*. The additional six cases, which I here give, have not been previously recorded.

Recent studies render it very probable that the original view of Addison is correct,—namely, that the symptoms of the disease are caused by loss of function of the adrenals. The evidence on which this is based is readily available in the elaborate Goulstonian Lectures of Rolleston,² in the address of Professor Schäfer³ on Internal Secretions, and in a paper by Dr. Oliver.⁴ On this view the disease is analogous in all respects to myxœdema, and is caused directly by the loss of the internal secretion of the glands. The comparison between these two diseases has frequently been drawn. As far back as 1885, in an article on Addison's disease in Pepper's "System of Medicine,"⁵ I used the following words:

¹ Ross, *Transactions of the Canadian Medical Association*, vol. i., 1877, and Pepper, *Transactions of the College of Physicians*, Philadelphia, Series iii., vol. viii.

² *British Medical Journal*, 1895, vol. i.

³ *Lancet*, 1895, vol. ii.

⁴ *British Medical Journal*, 1895, vol. ii.

⁵ Vol. iii. p. 947.

"The relation of affections of the thyroid gland to myxœdema and cretinism, and the experimental production of these conditions by the removal of the thyroid, have widened our view of the importance of the ductless glands. It is interesting to note the analogy between myxœdema and Addison's disease. In both there are distinct histological changes in the tissues—in one an increase in the mucin, in the other an increase in the pigment—and in both marked nervous phenomena: mental dulness, a progressive dementia in myxœdema, a profound asthenia in Addison's disease. We regarded the thyroid as unimportant to life until the experience of surgeons and extirpation in monkeys by Horsley demonstrated that abolition of its function was followed by a serious train of symptoms; and perhaps the experimental removal of the suprarenals in monkeys—so much more closely allied to man than the animals hitherto experimented upon—may demonstrate that these little bodies are also not without their influence upon health.

"Although the view of disturbed innervation consequent upon involvement of the abdominal sympathetic meets the case, theoretically, better than any other, and is at present widely held, yet there are signs of a return to the old view of Addison."

The analogy will be complete if it be found that in suitable cases the use of the suprarenal extract cures Addison's disease in the same remarkable way that the thyroid extract relieves myxœdema. Clinical workers may now contribute their share by carefully studying the effects of the extract in selected cases. Addison's disease is so rare that every opportunity should be seized. At the same time the greatest caution should be exercised, on the one hand, to select only well-characterized cases, and, on the other hand, to exclude cases in which the condition is a concomitant of widespread tuberculosis.

CASE I.—Failing health for a year; attacks of faintness; bronzing of face and hands; sudden death. (Abstract.)

A. J., aged about forty, lawyer, consulted me in the spring of 1885, complaining of weakness and attacks of faintness. He was a healthy-looking, well-nourished man, of good family history. For about a year he had been overworked and worried, and had had at times dyspepsia. On one occasion, in court, he felt very faint and almost fell. On two or three other occasions he felt very weak and prostrated without any obvious cause. For nearly a year he had noticed a gradual darkening of the skin of the face and of the hands. At the suggestion of his physician he sought an opinion as to the existence of Addison's disease. The patient's general condition was so good, without anæmia, loss of flesh, or any signs of tuberculosis, and the pigmentation was so slight and limited, that doubt seemed reasonable. Dr. Pepper saw the case with me, and we agreed that the pigmentation and causeless fainting spells were, to say the least, suggestive, and we advised him to give up business for a year and live quietly abroad. He went home prepared to follow our advice, arranged his affairs, and made preparations for his trip, when one morning he dropped dead in a railway station. There was no autopsy.

CASE II.—Gradual asthenia; progressive bronzing of the skin; attack of syncope; nausea and vomiting. Autopsy: cheesy foci at apex of left lung and in bronchial glands; tuberculosis of the adrenals; very slight matting of the semilunar ganglia and nerves.

Nellie R., aged forty-one; admitted to the Philadelphia Hospital July 2, 1886, with great weakness and bronzing of the skin. Her father and mother both died of heart-disease, one sister of dropsy, and one of heart-disease. She had small-pox when a child; otherwise she has been a very healthy woman until a year ago, when she was attacked suddenly with great pain in the region of the heart and with dyspnoea. The distress lasted for at least three days. Until April of this year she has been in fairly good health, except that she seemed more languid than formerly and felt indisposed to work.

Last November her friends noticed that she was changing in color, and throughout the winter her normally fair complexion has been replaced gradually by a dark bronze. Three weeks before admission she had a sudden attack of syncope, preceded by dizziness in the head. Shortly afterwards she began to vomit after meals, and has done so almost every day since. She has had no pain anywhere.

Present Condition.—Small, somewhat emaciated woman. Face, neck, and hands deeply, general surface of the trunk slightly, pigmented. The bronzing of the face is extreme; it is interesting to note that on the forehead the deep small-pox scars are unpigmented. The skin of the abdomen is much darker than that of the thorax; the fingers are not clubbed; the nails are incurved; the pulse is 96, small and thready; the heart-sounds are clear and loud; there is slight flattening beneath the clavicles at both apices, and the percussion note is a little high pitched, and there are a few râles on deep inspiration. The abdomen is soft; no pain on deep pressure in the epigastrium; no tenderness on either side in the renal regions. There is no pigmentation of the mucous membrane of the mouth. The color of the lips is fairly good; no anæmia; temperature 98° F.

The patient had most profound anorexia with great prostration, and once or twice vomited small quantities of blood. She gradually sank and died on the 13th.

Autopsy.—Body not emaciated; skin of face, neck, hands, and arms of a light bronze color; marked pigmentation of abdomen. On the inner surfaces of cheeks a dark patch on either side. Vaginal mucosa not pigmented; panniculus over abdomen three-fourths of an inch in thickness.

Peritoneum.—Adhesions between the surface of the liver and the diaphragm. The omentum is adherent to the wall of the pelvis. In thorax there are adhesions at the right apex and general adhesions at the left side. The heart contains fluid blood and clots. The valves are normal; the muscle substance is a little pale.

Lungs.—The left is crepitant except at extreme apex, and in two or three small areas of anterior margin, which show cheesy foci surrounded by gelatinous infiltration. The right lung is everywhere crepitant. The pleura is thickened, particularly at the apex. The bronchial glands are caseous.

Stomach.—Everywhere throughout the mucosa are small white bodies about two millimetres in diameter. There is pigmentation towards the pylorus; no erosions and no other special changes.

The *spleen* is of average size, closely adherent to the diaphragm, and the pulp looks normal.

The *liver* is small, united closely to the diaphragm. There are no tubercles, but in the adhesions on the right border is a small caseous body the size of a pea.

The *intestines* show no special changes except a slight enlargement of Peyer's patches and the solitary glands.

The suprarenals and sympathetic ganglia were dissected *in situ*.

The right splanchnic nerve is large, and a ganglion existed on it opposite the tenth dorsal vertebra. The left nerve is not so large and presents a smaller ganglion. The right nerve enters the semilunar ganglion, which is readily dissected, as it is not specially involved in cicatricial tissue. On the left side the ganglion is large, but also readily separated from the adjacent tissue. The nerves joining the two ganglia and those about the celiac axis are less distinct than usual, owing to the slight matting of the tissue. The nerves passing to the suprarenals are free.

The capsules are not much enlarged. The right is six centimetres long, very firmly adherent to the liver and to the inferior cava. The left, six centimetres in length, is closely united to the kidney and to the spleen. On section the right capsule presents no trace of normal gland tissue. The lower half is occupied by a large cheesy mass, the central portion of which presents a grayish translucent, fibrous tissue. The remainder of the organ is made up of a similar tissue in which are small cheesy nodules. Behind the *vena cava* there is also a solid caseous mass. The left capsule presents a firm, cheesy nodule just where its main vein emerges. The organ is flat and made up of a gray, translucent, fibrous tissue.

The kidneys are of average size. The left presents numerous small tubercles and one or two caseous masses which are in close proximity to the suprarenal capsules. In the pelvis the broad ligaments, ovaries, and tubes are closely matted together by old peritoneal adhesions.

The dissection of the nerves and adrenals is in the Mütter Museum of the College of Physicians in Philadelphia.

CASE III.—Dyspepsia and occasional attacks of vomiting for two or three years; for some months gradual pigmentation of the skin and mucous membrane of the mouth; attacks of dizziness; extreme prostration and anæmia; profuse diarrhœa; urgent vomiting; death; no autopsy.

William S., aged fifty-nine, longshoreman; admitted June 30, 1887, to the Philadelphia Hospital, complaining of vomiting and great prostration. With the exception of yellow fever, in 1864, he had enjoyed very good health until three years ago, when he began to have dyspepsia and occasional attacks of vomiting. He has, however, kept at work.

For many months past (he does not know the exact time) he has himself noticed, and his friends have remarked, that he was becoming very dark in color. Eight days before admission he had an attack of dizziness, in which he fell but did not lose consciousness. Since then he has been extremely prostrated and the attacks of vertigo have become more frequent.

Condition on Admission.—Large, well-nourished man; slight œdema of the feet. Skin of the face, neck, and hands of deep mahogany brown. General surface of the body very much darker than ordinary; sclerotics are pearly. The lips are pale, and there is evidently marked anæmia. Mucous membrane of the lips and inner side of the cheeks deeply pigmented, and a large patch can also be seen on the soft palate.

The lungs are entirely negative: no râles at the apices; no dulness; no sign of old tuberculous disease. The apex-beat is in the fifth interspace. Pulse 96, small. There is a venous hum in the vessels of the neck; no hæmic murmur at the base of the heart.

There is marked pain on pressure over the tenth and twelfth ribs on the left side; none on the right. The blood showed the characteristic features of an extreme anæmia, and the blood drop looked very watery. The count gave one million red corpuscles per cubic millimetre. Proportion of white to red one to four hundred.

The patient sank rapidly after admission; had profuse diarrhœa and urgent

vomiting, and died July 6. The temperature ranged from 98.2° to 101.4° F. So far as could be ascertained from the patient himself and his friends, there had been no tuberculous disease in his family.

This is the only case of Addison's disease which I have seen with profound anæmia, a symptom on which Addison laid a good deal of stress. In a majority of the cases the blood count does not fall below fifty or sixty per cent. A difficulty sometimes arises in the diagnosis of the disease in cases of severe anæmia of the progressive pernicious type which have irregularly mottled pigmentation. I have recently seen a case in which, with the progressive anæmia, there was a degree of asthenia and gradual pigmentation highly suggestive of Addison's disease.

CASE IV.—Gradually developing languor and asthenia; frequent attacks of causeless vomiting; progressive pigmentation of the skin; convulsions; toxæmia; death. Autopsy: sclerosis and atrophy of the adrenals; no tuberculosis.

David A., aged fifteen and a half, a patient of Dr. Mullin's, of Hamilton, Ontario, who consulted me by letter about him, and who very kindly sent me the suprarenal capsules for examination.

The patient's father died at forty-five from pulmonary tuberculosis of four years' duration. The mother is a healthy woman; the brothers and sisters are healthy.

The boy had suffered from no serious illness in early life, and had good health until the onset of the present illness. In March he had a slight febrile attack, in which he was confined to bed for two days. Early in April his mother noticed that he appeared to be sunburned, and she thought it was due to wearing his Scotch cap too long in the spring. He seemed also languid and listless, and did not seem able to apply himself to study. Early in the summer he was taken from school, as he fretted and cried frequently on account of the scoldings. Ever since the attack in March he has had at intervals of three or four weeks attacks of vomiting, in which he brought up greenish and yellow matter, after which he felt better. In the summer the mother noticed that the skin became much more discolored. He was very indolent and took but little exercise and did not engage in any sports. His complexion was fair and his hair of a light color and thin, so that his discoloration, which deepened through the summer, was very marked. He had at times very severe headache, and sometimes acted strangely, as if silly.

His final illness is so graphically described by Dr. Mullin that I give his statement in full.

"On Monday of this week he complained of sickness and headache. On Wednesday he did not rise from bed; that night he slept and did not complain. On Thursday he was languid and stayed in bed; vomited a little green matter; said he had no headache, but had a bad taste; he was dull and heavy; his eyes appeared strange, and he acted as if he did not wish to be disturbed. About 2 P.M. he took a little oyster-soup; this was taken quickly, and he then turned to the back of the bed; later he vomited slightly. About 5 P.M. he would not answer questions; turned to the wall as if he wished to sleep. A little before 6 P.M. a convulsion occurred, not violent; the limbs were fixed; he was quite unconscious, face a little drawn, and slight frothing; the hands jerked slightly. After this he did not speak, except to say 'yes,' 'yes'; he would put out his tongue and open his mouth, and then turned away and moved to the back of the bed. A few minutes after the convulsion he was seen by a physician, who said that the movements were very similar to those of an hysteri-

cal patient. I saw him at nine o'clock the same evening. He was not unconscious, but did not seem able to fully understand. He moved to the front of the bed at my request, but soon turned and moved to the wall. The pulse was feeble and could not be counted at the wrist; the hands were cold; temperature in axilla, 100° F.; it had fallen one degree since taken after the convulsion. The tongue was a little furred, yellow; the breath seemed foul. During the night he was very restless, tossing from side to side and pulling the bedclothes. He passed urine once; at this time he asked for the vessel. The next morning I visited him at ten. The hands were cold, bluish, nails blue; pulse so feeble that it could not be counted at the wrist; heart-impulses, 132 per minute. Occasionally he made a deep sighing inspiration.

"The brownish discoloration of the skin very marked on the face, the shoulders, and anterior part of the thorax; the surfaces of the extremities discolored, but not so deeply; the integuments of penis and scrotum much darker than elsewhere, and the areola around each nipple was discolored as in pregnancy. Along the spinous processes from the level of the scapular spines to the sacrum was a row of ten spots about the size of a quarter of a dollar more deeply discolored than the surrounding skin. No pigmentation of the mucous membrane of the mouth; the breath was offensive; urine free from albumin and sugar.

"Until the afternoon he was very restless, pulling the bedclothes, and tossing about from side to side, and at 4 P.M. one-third grain of morphine was given hypodermically. After this he became more quiet, and when I visited him at 9 P.M. he was sleeping. He continued quiet during the night, and died the following morning about nine o'clock."

Dr. Mullin was kind enough to give me the opportunity of examining the suprarenals, sections of which I showed one evening at the Pathological Society of Philadelphia. Unfortunately, the specimens and sections of both this and the following case have been mislaid. Both capsules were extremely small, not half the normal size, and surrounded by much fat. They were firm, and on section showed no distinction between the medullary and cortical portions. Microscopically, there was a condition of diffuse sclerosis, with here and there areas of fatty degeneration. There was no tuberculosis of the organs.

CASE V.—Attacks of vomiting and indigestion for eight months; gradual pigmentation of the skin; intense prostration; death. Autopsy: tuberculosis of both adrenals; no involvement of other organs.

William B., aged nine, a patient of Dr. William E. Parke, of Philadelphia, Pa. The boy was at Girard College, and according to the doctor's statement he had seen him, on and off, for about eight months, during which time he had been repeatedly admitted to the infirmary with attacks of vomiting and indigestion, occasionally with a mild tonsillitis. His color had changed and he had become very much bronzed, but this was suggested to have been due to a dark ancestor. His last illness was characterized by most intense prostration and weakness, and obstinate vomiting. There was no elevation of temperature; the pulse had been rapid, but on the morning of his death it came down to forty.

I made the autopsy on the 28th of March, 1888. Unfortunately, the notes which I dictated to Dr. Parke at the time were mislaid. The skin was uniformly pigmented and about the color of a mulatto's. There was no enlargement of the lymph-glands; the heart and lungs were normal; no tuberculosis; no involvement of the lymph-glands in the abdomen; no changes in the stomach or intestine. The suprarenal glands alone were diseased. Both looked small; the right was larger than the left, and presented a flattened tuberculous mass about the size of an almond,

the left a smaller mass in the upper part of the gland. There was no thickening or adhesion about the semilunar ganglion in the nerves passing to the glands.

CASE VI.—Pulmonary tuberculosis; injury two years ago; dyspepsia; gradual asthenia; pigmentation, deepening for nearly two years; treatment for eight months with suprarenal extract; rapid disappearance of the serious symptoms; marked and persistent improvement in general condition; no change in the pigmentation.

William H., aged forty-six, sail-maker, admitted to the Johns Hopkins Hospital May 3, 1895, complaining of cough, shortness of breath, great weakness, and a change in the color of his skin.

Family History.—His father died of cholera morbus and his mother from the effects of a stone in the bladder. He had three brothers and two sisters, all of whom are dead. He does not know of what the brothers died. One sister died in confinement; the other from poisoning by mercury. He knows of no tuberculosis in his family, and none of his relatives have had discoloration of the skin.

Personal History.—When a child he had measles, diphtheria, chicken-pox, and mumps, and when about seventeen years of age, varioloid. In his sixteenth year he served on board a man-of-war at Panama, where he had a protracted fever of nearly four months' duration. Shortly after this he had jaundice for a month, since when he has never had a very healthy or natural-looking color of the skin. Ten years ago he had two attacks of severe pain in the hypochondriac and epigastric regions, lasting about five hours. He was doubled up with the pain and had to have morphine. The attack was not followed by either jaundice or chills. In July, 1893, the patient was run over by a wagon, the wheels passing over his abdomen just below the navel. He was laid up for two months, and suffered a great deal of pain in the abdomen. There was no paralysis afterwards, but he has not been very strong since. For two years the skin has been growing darker in color, and his friends have noticed that within the past five or six months the pigmentation has become much more intense. He has had at intervals throughout his life attacks of indigestion, and at times belching, but no vomiting. Twelve years ago he had an attack of diarrhoea, which lasted for a week. During the past two years he has lost very much both in flesh and strength, and for some months has had no ambition whatever for his work.

He is uncertain how long he has had a cough, but five weeks ago he began to have a great deal of cough with much muco-purulent expectoration. He has not had any pain, but he has suffered a great deal with shortness of breath on the slightest exertion, and he has the dyspnoea even when resting quietly in bed. There have been profuse night-sweats. He has been losing flesh rapidly, and has become very weak. The appetite is poor, but he has had no nausea and no vomiting. He has had no palpitation of the heart.

Present Condition.—The patient is a small-framed, poorly-nourished man; height about five feet, eight inches; present weight ninety-nine pounds. Temperature on admission was 101° F.; pulse, 136; respiration, 40. The eyes are sunken, and he looks very apathetic. One's attention is immediately attracted by the intense pigmentation of the skin, particularly of the face and forehead, which is of a uniform deep brown with irregular patches of a darker color. The lips and mucous membranes are not anemic. On the roof of the mouth there are two patches of pigmentation; on the velum there is slight pigmentation; no spots on the lips, cheeks, or gums. The skin of the hands and wrists is of a very deep bronze color. The pigmentation is more marked in the axillæ and at the bends of the elbow. The areolæ of the nipples and the genitals are dark brownish-black in color. The general surface of the body shows a marked bronzing. There are areas of very deep pigmentation on

the shins, and there is accentuation of the bronzing on either side of the great toes. The superficial glands are not enlarged. The epididymes and testes are normal. The pulse is regular, of medium volume, tension normal, the vessel wall slightly thickened.

The thorax is symmetrical, expansion slight, both clavicles prominent. The percussion-note is slightly impaired in the right front, and here from the second space there is a well-marked friction rub, heard throughout the mammary and axillary regions and around to the back, throughout the infrascapular area. At both apices behind there are a few fine moist râles. On the left side auscultation is negative. The sputum the day after admission was very abundant and frothy, containing a considerable quantity of greenish muco-pus, but tubercle bacilli were not found.

The apex-beat of the heart is in fifth interspace, just outside the nipple line. The sounds are everywhere clear.

The abdomen is somewhat retracted, nowhere tender; the border of the liver is not easily palpable; no increase in the area of liver flatness. The spleen is not palpable; neither kidney can be felt.

There is no enlargement of the thyroid or of the lymphatic glands; no nodes or lesions of the bones.

From the date of admission to May 16, the patient's temperature ranged from normal to about 101° F. The pulse-range was from 120 to 130; respirations from 25 to 35. He expectorated about two hundred and fifty cubic centimetres of sputum, which was examined every other day for tubercle bacilli, but without result; and no elastic tissue was found. The patient has been in bed, and the general prostration and the rapidity of the heart-action have been out of all proportion to the amount of local disease of the lung.

On May 16 the treatment with suprarenal extract was begun. Thirty-six pigs' suprarenals were obtained at the time of slaughtering, cut up finely, thoroughly powdered with pestle and mortar, and to this mass about six ounces of pure glycerin were added, and the whole allowed to macerate for thirty-six hours in a refrigerator. The mixture was then filtered several times through fine-meshed gauze. The filtrate consisted of a reddish-brown syrupy fluid of a rather disagreeable odor. After filtering there were thirty-eight drachms of the extract, so that one drachm corresponded to a capsule. The patient began with half a drachm of the extract three times a day.

The patient's blood-count when he began the treatment was: red corpuscles, 4,564,000; leucocytes, 6600; hæmoglobin, eighty-five per cent.

On May 20 tubercle bacilli were found in the expectoration for the first time. The cough and shortness of breath had been very much better. Prior to the treatment with the suprarenal extract the patient had gained one pound. The note by Dr. Thayer on May 24, eight days after beginning the use of the extract, was: The patient looks brighter and says he feels better. The pulse, which had ranged from 120 to 140, is now 100. He has gained three pounds in weight.

On June 6 the amount of the extract was increased so that he took the equivalent of three glands daily. Numerous careful blood-counts were made, and a differential count of the leucocytes. There was moderate leucocytosis; there were no nucleated corpuscles. The number of reds on June 6 was about 4,000,000 per cubic millimetre; leucocytes, 8000.

After May 20 the patient's temperature remained normal.

During the week ending June 16 the patient gained five and a half pounds,—a gain of nine and a half pounds since the use of the extract was begun. The patient continued to take the equivalent of three glands daily. A note by Dr. Thayer on June 19 is as follows: Temperature has been quite normal for more than a month. The pulse, which had ranged between 120 and 140 to the date of beginning the extract, has gradually fallen until during the last week the range was between 84 and

104. The amount of sputa has diminished to less than forty cubic centimetres in the day. The patient says he feels much better; his appetite is good, and he looks a great deal brighter. The condition of the lung has improved, and the friction murmur is no longer heard.

On June 28 tubercle bacilli were found. The treatment was continued throughout July and August, and in spite of the hot weather he improved progressively. The gain in weight was remarkable. In July his weight increased from one hundred and ten and a half to one hundred and fifteen pounds. In August, during the very hot weather, he lost again slightly in weight.

He left the hospital on September 10. The change in his condition had been very remarkable. When admitted he could scarcely walk to the bed, and was profoundly asthenic and emaciated. The general appearance had improved wonderfully; he was bright and active, and said he felt vigorous. His weight on discharge was one hundred and eighteen pounds, a gain of nineteen pounds. The pigmentation was unaltered.

Since his discharge he has been at work, and has reported at the hospital occasionally. He felt so well that throughout the latter part of November and December he remained without any of the suprarenal extract, and he lost three pounds in weight in that time. His condition to-day—January 15, 1896—is as follows:

The color is good. To me his face looks a little less pigmented, but Dr. Thayer, who had the patient in charge during the summer, while he was in the ward, does not think that there is any material change in the face, but thinks the discoloration is less intense on the trunk. It is still of a very advanced grade, such as is seen only in the most typical cases of the disease. The small patches of pigmentation on the palate have disappeared. The local condition in the lung has cleared, and there are now only a few râles to be heard occasionally on coughing. The friction is still audible just outside the right nipple. The change in the patient's general vigor is remarkable. He walks briskly, is active, energetic, in very good spirits, and says that he is as well as he ever was in his life.

THE CONNECTIONS OF THE FILLET WITH THE CEREBRAL CORTEX.¹

BY PROFESSOR AND MADAME DEJERINE,

Salpêtrière, Paris, France.

THE fillet is regarded as the course pursued by the sensory impulses passing from the medulla oblongata towards the brain. The ancient conception of the sensory tract of Meynert, adopted by Huguenin, Charcot, Ballet, and Brissaud, is in reality no longer admitted. According to Meynert, the sensory fibres arising in the nuclei of Burdach and Goll form after decussation in the bulb the external or sensory portion of the pyramids, traverse the anterior region of the pons, constitute farther on the external tracts in the base of the cerebral crura, and finally radiate in the occipital

¹ Translated by Dr. Wm. G. Spiller, assistant pathologist to the Pennsylvania Institution for Feeble-Minded Children.

lobes. This is an opinion now abandoned, for Flechsig has shown that the external tract of the base of the cerebral crus does not form the sensory decussation of the bulb, but that it is arrested in the pons, and that it constitutes a cortico-pontine union. One of us has shown, besides, that this external tract of the base of the cerebral crus derives its origin not from the occipital lobe, but from the middle part of the temporal lobe, and that it degenerates after lesions of this part.

In 1885, Edinger and Flechsig showed that the fibres of the sensory decussation originating in the nuclei of Goll and Burdach formed the inter-olivary layer of the bulb, and in the pons the band of fibres of a rectangular appearance, situated at the junction of the anterior and posterior regions of the pons, and known by the names of main tract of the fillet, upper fillet, lemniscus, *obere Schleife*, *ruban de Reil médian*, etc. This part of the fillet was ignored by the ancient authors, who recognized only that portion which was visible on the lateral face of the tegmentum, above the pons, between the posterior corpora quadrigemina and the crusta, and which they named laqueus, lateral triangular tract of the pons. This is now known as the lower fillet (*untere Schleife*, *ruban de Reil inférieur*). We know, further, that the lateral or lower fillet has nothing to do with the sensory decussation, that it constitutes a small superadded band, which connects the superior olive with the posterior corpora quadrigemina, and that it represents one of the central connections of the auditory nerve.

The superior connections of the upper fillet afford a very complex study. Before Forel (1877) it was acknowledged, with Meynert, that this tract entered the anterior corpora quadrigemina. Forel showed that it enters also the optic thalamus, and gave the name of *obere Schleife* (upper fillet) to the part which passes to the anterior corpora quadrigemina, and of *Thalamusschleife* (thalamus fillet) to the optic thalamus portion of this tract. Flechsig (1881), relying on the anatomy of development, and von Monakow (1884), depending on the experimental pathology, admitted that the upper fillet is in connection with the cerebral cortex, especially with the parietal lobe; but while, according to Flechsig,—whose opinion has been adopted since by Bechterew, Edinger, and Obersteiner,—this continuity is uninterrupted, according to von Monakow it is interrupted, and is formed by the mediation of the thalamus. This cortical tract was designated by von Monakow by the name of *Rindenschleife* (cortical fillet). According to the majority of the authors, it is the internal portion of the upper fillet which contains the fibres of the thalamus fillet and of the cortical fillet; the external part contains the fibres to the anterior corpora quadrigemina; it contains besides—according to Flechsig and Bechterew, whose opinion has been shared by Edinger, Obersteiner, and Henschen—fibres which enter into the constitution of the *ansa lenticularis*, and pass to the *corpus subthalamicum*, and to the *globus pallidus* of the same side; according to Bechterew some fibres are conveyed through the intervention of the commissure of Meynert to the *globus pallidus* of the opposite side. When the

upper or main fillet is injured by a primary lesion occupying the pons, its fibres degenerate in two directions. On account of this fact, which is indisputable, most authors have admitted that the upper fillet contains several kinds of fibres, some of which present a *descending* degeneration, others an *ascending*. The majority admit even that the degeneration of the fibres of the fillet is especially a *descending* degeneration, and that the cells of origin, or trophic cells of this tract, are located in the superior regions of the neural axis (anterior corpora quadrigemina, optic thalamus, corpus subthalamicum, globus pallidus, cerebral cortex).

The cases of degeneration of the fillet following lesions of the pons are not rare, and have been recorded by Homen, Kahler and Pick, P. Meyer, Spitzka, etc. We have been able ourselves to study personally three cases, in which the lesion occupied the superior or middle part of the pons, being situated at the junction of the formatio-reticularis and the anterior portion of the pons, and destroyed nearly all the upper fillet and the greater part of the pyramidal tract. In these three cases the degenerated fibres of the upper fillet can be followed above the primary lesion as far as the region of the anterior corpora quadrigemina, and the inferior part of the optic thalamus, *but not beyond*. The posterior segment of the internal capsule especially is absolutely intact, as well as the ansa lenticularis, the corpus subthalamicum, the globus pallidus, and the commissure of Meynert. Below the primary lesion in our three cases an almost complete atrophy of the interolivary layer exists on the same side. An atrophy of the internal arciform fibres of the bulb and a diminution in volume of the nuclei of Goll and Burdach are found on the opposite side.

When the fillet is injured in the bulb,—be it at the level of the interolivary layer (Kahler and Pick), at the level of the decussation of the pyramids (Schultze), or in advance of or at the location of the nuclei of Goll and Burdach, as we have been able to establish in two cases of syringomyelia with destruction by the glioma of the nuclei of Goll and Burdach, and as P. Meyer, Rossolimo, Hoffmann, Schafer, Miura, and Schlesinger have noted,—there is observed an ascending degeneration of this tract, a degeneration which, as in cases of pontine lesion, cannot be followed beyond the subthalamic region and the inferior part of the optic thalamus. In our own two cases of destruction of the nuclei of Goll and Burdach the posterior segment of the internal capsule is absolutely intact.

The ascending degeneration of the fillet following a lesion of the nuclei of Goll and Burdach is confirmed also by the experimental researches of Vejas, Singer and Münzer, and especially by those of Mott. In five cases of ablation of the nuclei of Goll and Burdach in the monkey, this author has not been able to follow the degeneration of the fillet beyond the subthalamic region.

It results, then, from these facts that the degeneration of the fillet following lesions of the pons or bulb is an ascending degeneration, and that *this degeneration cannot be followed beyond the inferior part of the optic*

thalamus. Let us consider now the condition of the fillet following lesions of the subthalamic region, of the optic thalamus, and of the cerebral cortex.

When a lesion of the optic thalamus, of the subthalamic region, or of the superior portion of the cerebral crus destroys the fillet, an atrophy of the upper fillet is observed, as Witkowsky, Schrader-Hitzig, Henschen (Cases XI. and VIII., vol. iii.), Hösel, Jacob, and Greiwe have noted.

We have been able to study by the method of seried microscopic cuts four cases of ancient lesions of the thalamus and one case of lesion of the subthalamic region, involving the sublenticular portion of the internal capsule and the tract of Türeck, and cutting the fillet in the subthalamic region. We have established the following facts:

The lesions of the optic thalamus involve the fillet when they are ancient, and when they occupy the inferior and posterior portion of this ganglion, especially the median centre of Luys, and, above all, the field of fibres situated at the posterior and external part of the nucleus just mentioned,—a field which, as shown by seried cuts, comprises the continuation of the fibres of the upper fillet.

The same is true of lesions which are located in the subthalamic region or in the tegmentum of the cerebral crus, and which involve directly the upper fillet.

But in all these cases it is a process of *slow atrophy*, without degeneration properly so called, able, however, to end in the complete disappearance of the fibres.

This atrophy diminishes from above downward, from the thalamus towards the nuclei of Goll and Burdach, and is proportioned to the degree of destruction of the fillet and to the period of survival of the patient.

In the case of the lesion in the subthalamic region, which existed twenty years, the atrophy of the fillet, very intense in the tegmentum of the cerebral crus and in the superior part of the pons, was much less marked at the level of the bulbo-pontine fissure; the interolivary layer of the bulb and the internal arciform fibres of the opposite side were relatively very little involved.

The same condition existed in the four cases of lesions occupying the inferior part of the optic thalamus, but in these cases the atrophy of the fillet did not pass beyond the bulbo-pontine fissure. The interolivary layer, the decussation of the sensory fibres in the bulb, and the internal arciform fibres of the opposite side were only slightly diminished in volume.

We believe that in these cases of atrophy of the fillet following thalamic, subthalamic, or crural lesions it is an atrophy *retrograde, cellulipetal*, —i.e., developing from the periphery of the neuron towards its cell of origin, and analogous to that which occurs after a long period in the central or cellulipetal segment of an encephalic or medullary tract sectioned by a lesion.

In other words, we are inclined to admit—and in this we follow the

opinion of von Monakow—that the upper fillet is largely composed of fibres of which the cells of origin are located in the nuclei of the columns of Burdach and Goll. According to our opinion it has not been demonstrated that the thalamus contains cells of origin for fibres which go to the nuclei of Goll and Burdach. If these fibres exist, they are not, at all events, very numerous.

It is by an analogous process—that is to say, by a retrograde, cellulipetal atrophy—that we interpret the descending degeneration of the fillet which is found following lesions of the pons. If in the latter case the atrophy is much more intense than in crural, subthalamic, or thalamic lesions, it is not only because the destruction of the fillet is often in these cases more complete, but especially because the seat of lesion is nearer the cell of origin. It is, in a word, a process absolutely analogous to that which occurs, as Forel has shown, after section of a motor nerve. The atrophy of the central end of a sectioned nerve, which may result in the complete disappearance of the fibre and of the cell of origin, even in the adult, is proportionally more marked as the section approaches the point of emergence of the nerve. As to the connection of the fillet with the *cerebral cortex*, according to Flechsig and Hösel they are *direct*, according to von Monakow and Maheim they are *indirect*.

In 1890, Flechsig and Hösel reported, in support of the direct continuity of the fillet with the cerebral cortex, a case of porencephalia of the ascending parietal convolution with atrophy of the upper fillet in its entire extent. In 1893, Maheim, in reference to a personal case,—extensive cortical and subcortical lesion existing from early infancy and presenting an atrophy of the fillet,—remarked that the lesion of the fillet established by the authors preceding did not necessarily imply the existence of a direct cortical connection, but that it was probably in his case a secondary atrophy, and entirely comparable with those secondary atrophies, indirect in the sense employed by von Monakow, which are observed in the experimental method of Gudden on new-born animals. The facts elicited by the anatomico-pathological investigations which we have followed for several years regarding the course of encephalic tracts have established conclusions contrary to the opinion of Flechsig and Hösel. We have examined by this method of serial microscopic cuts nineteen hemispheres containing cortical lesions *without participation in the lesions of the central gray masses*.

The cortical lesions were more or less extensive, but in these nineteen cases they involved the Rolandic region and the parietal lobe. In all these cases a hemiplegia, very marked and with contracture, had been noticed during life, and in these different cases the duration of the lesions varied from ten to seventy-seven years. Of these nineteen cases three were cerebral infantile hemiplegia. However long the affection had lasted, however intense the degeneration of the pyramidal tract, *in none of these cases was the fillet degenerated*.

In the cases which had lasted a long time or begun even in infancy this

tract was diminished in volume, but it was a simple atrophy, a diminution of the calibre and not of the number of the fibres, no matter how great the secondary atrophy of the optic thalamus in these nineteen cases might be.

The recent experimental investigations of Bielchowsky (1895)—who established a perfect integrity of the upper fillet in two dogs after Goltz had removed the cerebral mantle and the corpus striatum—add new proof to the indirect connections of the fillet with the cerebral cortex.

According to our view, the fillet is likewise in no direct connection with the corpus subthalamicum and the globus pallidus, and is not continuous with the ansa lenticularis, as Flechsig, Bechterew, Edinger, Obersteiner, Henschen, and very recently Jacob (1895) have held. We have had the opportunity to examine three cases of very old lesions, at the same time cortical and central, which had destroyed, in a degree more or less marked, the island of Reil, the Sylvian operculum, the putamen, the caudate nucleus, and the globus pallidus. The internal capsule and the optic thalamus were, on the contrary, absolutely intact. In these cases a degeneration more or less pronounced of the ansa lenticularis and of the lenticulo-caudate fibres to the corpus subthalamicum existed. The degenerated fibres traversed the internal capsule, and could be followed in the corpus subthalamicum and in the optic thalamus, *but the integrity of the fillet was perfect.*

The study of the serial microscopic cuts, especially of horizontal cuts, shows (see our "Anatomy of the Nervous Centres," vol. i.) that the thalamic fasciculus of Forel and the field of Forel correspond to the superior and anterior part of the capsule of the nucleus rubra, and that they are separated from the upper fillet by the thickness of this nucleus. Whatever may be the fact as regards this last point, the investigations which we have just mentioned demonstrate that the fillet does not ascend directly from the nuclei of Goll and Burdach towards the cerebral cortex, but that the sensory path—bulbo-cortical—comprises two neurons,—viz., a neuron inferior or bulbo-thalamic, represented by the upper fillet, and a neuron superior or cerebral, connecting the thalamus with the cerebral cortex. Possibly there exists in the thalamus, as von Monakow believes, a short neuron interposed, which is represented by the type of cell with a short axis-cylinder described by Golgi. In no case can we support the hypothesis of Jacob, according to whom the cells of origin of the fillet are located in the thalamus or in the subthalamic region, and emit—analogueous in this respect to the cells of the spinal ganglion—two axis-cylinders, of which one (cortical fillet) passes towards the cerebral cortex, while the other (upper fillet) branches out in the nuclei of the columns of Goll and Burdach. The lesions of the thalamus and of the subthalamic region, which we have reported above, in which the internal capsule (and consequently the cortical fillet) is absolutely intact, and in which the atrophy of the upper fillet is proportional to the period of survival of the patient, are absolutely contrary to this hypothesis.

FIBROMYOMA COMPLICATING PREGNANCY.

BY JOHN B. MURPHY, A.M., M.D.,

Of Chicago,

Professor of Surgery and Clinical Surgery, College of Physicians and Surgeons; Professor of Surgery, Post-Graduate Medical School and Hospital; Attending Surgeon, Cook County Hospital; Attending Surgeon, Alexian Brothers' Hospital; Consulting Surgeon, Hospital for Crippled Children; President of the National Association of Railway Surgeons, etc.

NETTIE S., aged thirty-nine, colored, was admitted to the Cook County Hospital October 19, 1895; family history negative. She was married two years ago; has had no children; no miscarriages nor abortions; has always enjoyed excellent health, with the exception of the present trouble. Menstruated at about fourteen; was regular, fairly profuse, lasting about four days; no clots, never hemorrhage. Present illness began in July, 1895, with a cessation of menstruation, which has not appeared since. She has not had sexual intercourse for three or four months. After the suppression of the menses, she noticed a tumor just below the umbilicus; it has since rapidly increased in size. It has not been accompanied with pain. There has been no backache; the greatest discomfort has been produced by pressure of the tumor against the edge of the ribs. No urinary symptoms; there has been no discharge.

Physical Examination.—Patient well nourished; large physique; considerable adipose; abdomen very markedly distended and irregular in contour. Nodular growth can be felt in the abdomen, extending above the umbilicus, and especially to the right side, where it presses against the margin of the ribs. One of the nodules below the umbilicus is about the size of a child's head, of hard consistence, and fairly movable. The whole mass can be moved laterally about two and one-half inches, but not up or down. In the median line, from two inches below the umbilicus to the symphysis, fluctuation can be felt. It is apparently deep-seated, and surrounded by an irregular margin. No foetal heart-sounds nor placental souffle can be heard.

Vaginal examination reveals a large, hard mass, entirely filling the pelvis. The os can be felt above the symphysis. By pressing the tumor up, the sound can be introduced into the uterus two and one-half inches, but not farther, it being extremely difficult to get the os in position for the introduction of the sound. The tumor in the pelvis is very firm, smooth on its surface, and of very hard consistence.

Diagnosis.—Uterine fibroid, with cystic degeneration. The rapidity of growth and the absence of the history of hemorrhage somewhat oppose the diagnosis of fibroid, but this was explained subsequent to the operation.

Celiotomy, October 25, 1895.—Tumor found to be free from adhesions. On lifting it out of the abdomen, through a very long incision, and turning it to elevate the large nodule out of the pelvis, the left broad ligament ruptured close to its attachment to the tumor. There was profuse hemorrhage for a few seconds. The ligament was clamped with a long pedicle-forceps, and the broad ligaments were ligated and excised. The uterus was situated on the anterior surface of the pelvic portion of the tumor, and was about six and one-half inches in length. An elastic ligature was placed upon the stump, allowing the cervix to remain, so as to treat the pedicle externally. Two large pedicle-forceps were placed above the ligature and the uterus

was amputated. There was blood in the pelvis. The parietal peritoneum was sewed to the cervix, all the way around, just below the elastic ligature. The abdominal wound was closed down to the pedicle, packed around with iodoform gauze, and dressed antiseptically.

Time of operation, twenty-two minutes. The mass weighed six pounds, six ounces. It consisted of a large irregular fibroid, growing from the posterior wall of the uterus. The uterus was enlarged about six inches and contained a sac of fluid. When opened, a foetus of about three months was found in the sac, which had not been ruptured. The question of pregnancy had been thoroughly considered before operation, and thought impossible from the patient's statements and the absence of physical signs. The impregnation accounted for the great rapidity of the growth, it being borne in mind that the patient had never noticed the tumor till July.

The patient made an uninterrupted convalescence; she did not vomit from the anæsthetic, and at no time did her temperature reach 100° F. The highest pulse-rate was 96, and that was immediately after the operation. There was no secretion from the stump, which remained perfectly dry for fifteen days, when a slight serous exudate appeared at its base, the line of separation. The pedicle sloughed on the twenty-seventh day after the operation: the patient is now sitting up in bed.

This completes a series of ten consecutive abdominal hysterectomies, with ventral fixation of the pedicle, for large fibroids, not previously reported, all of which recovered.

That pregnancy should complicate uterine fibroma is not surprising, as Gusserow,¹ in quoting Bayle's statistics, states that twenty of every one hundred women over thirty-five years of age have fibromata of greater or lesser size; and Klob² states that forty per cent. of all women over fifty years of age have fibromata.

That pregnancy does not appear more commonly with fibroma is accounted for by the facts, first, that the fibroma itself tends to sterility, as it produces a pathologic condition of the endometrium, except in the sub-peritoneal variety; second, that the fibroma does not in the majority of cases attain a considerable size until after the childbearing period is passed; and, third, that the fibroma, in the great majority of cases, does not produce any disturbance during the period of gestation, and in many cases does not complicate labor. If it has attained a marked size before impregnation, its development is greatly enhanced by the pregnancy. The variety of fibroma in which the muscular element predominates over the fibrous increases most rapidly under the stimulus of pregnancy. The tissue becomes œdematous and doughy, as may be noted in the posterior wall of the uterus and the portion of the tumor attached to it in the specimen presented.

The uterine fibroid of large size rarely admits of the completion of the period of gestation, which usually terminates in abortion, hemorrhage, impaction of the pelvis, labor-pains, placenta prævia, rupture of the uterus, death of the foetus, or sepsis. That the presence of fibroma with preg-

¹ Die Neubildungen des Uterus, 1886.

² Winckel, Ueber Myoma des Uterus, Völkmann's Sammlung klinische Vorträge, No. 98.

FIG. 1.



Position of foetus in uterus with placenta attached.

FIG. 2.



Posterior surface of uterus and tumor with foetus.

nancy does not deserve surgical attention was well established by Theodore Landau.¹ He expresses himself in the following words:

"A myoma which rests in or on an impregnated uterus does not of itself demand the attention of the surgeon. Only when the tumor produces unpleasant symptoms is active interference indicated. The principal of these unpleasant symptoms are mechanical or pressure symptoms, as incarceration of the uterus in the pelvis, galloping increase in size of growth, nephritis, uræmia, ascites, etc., as well as the reflex manifestations of pressure,—cardiac, respiratory, and gastric. When these disturbances are sufficiently severe to demand the physician's attention, the question arises, What shall be the procedure? Will it be an enucleation of the fibroma, an induced abortion, an abdominal hysterectomy, or an abdominal extirpation of the fœtus without the removal of the uterus and appendages? The selection of operation will depend on whether the immediate emptying of the uterus is necessary, and, if so, whether it is possible for the fœtus to pass from the uterus through the cervix and vagina, or whether it is desirable to have the tumor in itself removed at the same time that the patient is freed from the fœtus. When the pelvic passage is blocked, then only is laparotomy to be considered."

This statement was made three years ago. The improvements in technique and statistics of abdominal hysterectomy have produced an entire change in the conditions which guide us in our selection of procedure. It is a grave question whether induced abortion in the presence of a large fibroid is not to-day as serious a procedure as an abdominal hysterectomy in the hands of an expert operator. It is certain that, if the tumor itself demands removal, it is better that the tumor, uterus, and fœtus *in situ* should be removed at once, without attempting a previous abortion. The recognized dangers in parturition of a myomatous uterus are atony, hemorrhage, peritonitis, gangrene of the tumor, rupture of the uterus, and retention of the placenta. These dangers are all present with abortion, some in a lesser and some in a greater degree than in labor at full term. The dangers of sepsis and hemorrhage are very much greater in induced abortion, while the dangers of rupture and gangrene of the tumor are less. Gusserow reports a death from intraperitoneal hemorrhage in induced abortion from rupture of the veins around the tumor.

The statistics for simple myomectomy without removal of the uterus, collected by Landau, representing eighteen cases at different periods of gestation, ranging from twelve weeks to seven months, and in the hands of fourteen different operators, show four deaths and seven miscarriages. The operation was first performed by Péan, December 15, 1874. It can be seen that the mortality for this operation is twenty-two per cent. and for abortion about forty per cent. (Würkert² collected twenty-seven cases, with seven deaths),—not encouraging from either stand-point, notwithstanding the

¹ Völkman's Sammlung klinische Vorträge, No. 26, Neue Folge.

² Centralblatt für Gynäkologie, 1893, No. 45, p. 1056.

beautiful results produced by Schroeder, Landau, Fromel (four cases and one death), and others. The same author collected eighteen cases of supravaginal amputation of an impregnated myomatous uterus (first performed by Kaltenbach,¹ March 2, 1880), at different periods of gestation, ranging from two to eight months, by different operators, with seven deaths,—a mortality of about thirty-nine per cent.

From these statistics the operations of enucleation and amputation are to be considered very grave undertakings, both for the life of the foetus and the life of the patient. Still, these statistics were collected before 1890, and the operation of abdominal hysterectomy had then a much larger mortality than now. It is to be hoped, therefore, that the statistics of the future, as well as those of the past two years, will show a great improvement in the results of the amputation of the gravid myomatous uterus over the period preceding 1890.

Landau concludes that hysterectomy should be the operation of selection, in submucous, intramural, and multiple fibroids, enucleation coming in question only where the tumor is pedunculated or of small size and subserous.

Contrary to general belief, the difficulties of operating on the impregnated uterus are less than in the non-impregnated, and Hoffmeyer says that whoever has seen an operation on the gravid uterus must admit that this statement is true. The vessels are larger, the uterine body is lifted up out of the pelvis, and the ligaments are more easily reached in the impregnated than in the non-impregnated uterus. The danger following the operation, he says, should be less, if care be taken to remove all of the placenta and membranes.

For operation, fibromata are conveniently divided into (1) impacted pelvic myomata. These are the most favorable for operation, and they usually originate from the cervix uteri, and can be enucleated through the vaginal wall without opening the peritoneal cavity. This procedure, says Chrobak, should always be followed, except where the tumor is larger than a child's head. (2) Extra- or retrovaginal impacted fibroids. These may originate in the cervix or in the lower portion of the corpus uteri, and are usually, in the process of the enlargement of the uterus, lifted out of the pelvis into the abdomen (Spiegelberg), and are removed by laparotomy. This may occur even though they be retrovaginal primarily and originate from the cervix. (3) Abdominal fibroids. The latter usually originate from the body of the uterus, and are removed by coeliotomy.

When should the operation be performed? In the process of enlargement the uterus lifts itself out of the pelvis; the fibroid may remain in the pelvis or accompany the uterus. The symptoms of impaction, as a rule, are transitory, as the uterus accommodates itself to its surroundings. If, however, these symptoms persist, they must be relieved, either by lifting the

¹ Centralblatt für Gynäkologie, 1893, No. 45, p. 1055.

uterus and tumor out of the pelvis or by enucleating the tumor. The rule laid down by Schroeder is that the operation should be postponed as long as possible. He says that the prognosis of hysterectomy is more favorable, particularly of retrocervical myoma, the later in pregnancy it is performed, and most favorable if performed at the end of gestation, because at this period we jeopardize the mother less and favor the preservation of the child. When the period of gestation is complete and abdominal section is indicated, we must then decide whether it shall be Cæsarean section, Porro, or hysteromyomectomy. The statistics of the Cæsarean section with fibroma show the results to be extremely discouraging; the majority of the cases terminated fatally, even with Säger's method. The Porro, without the removal of the tumor, can be accomplished in only a small number of cases, and should not be attempted. Hysteromyomectomy is the most desirable as well as the most favorable to both the mother and the child. The question of treatment of the pedicle—shall it be extra- or intraperitoneal or a total extirpation?—must be decided by the individual operator, as each can obtain better results with the method with which he is most familiar. True, the extraperitoneal variety tends to longer convalescence, but it has the advantage of leaving the peritoneum practically without an abrasion.¹ Gusserow collected in all two hundred and twenty-eight cases; the mother died in one hundred and twenty-three, a mortality of about fifty-four per cent.; and sixty-seven children, a mortality of thirty per cent. This includes the operations performed in the preantiseptic period and a few in the antiseptic period, but does not include any cases of the aseptic era. Chrobak in 1893 successfully treated a case of this kind in which he performed total extirpation of the three-months' impregnated uterus with internal treatment of the stump. From Schroeder's stand-point, the most desirable time to operate is at the completion of the period of gestation, and the most favorable operation a hysteromyomectomy.

In the case here presented the indication was to immediate hysteromyomectomy, as it was not possible even to sound the uterus from the vagina, and delivery through the vaginal route could not be thought of. The tumor was producing pressure symptoms, and pregnancy had existed only three months. The broad ligaments were well elevated above the brim of the pelvis; the laceration produced in the left was caused by the great distance to which the uterus had to be elevated before the tumor, which was situated deep in the pelvis, could be turned out. The application of the ligature and clamps was less difficult than in the average abdominal hysterectomy where pregnancy was not present.

The statistics collected by Gusserow are certainly not encouraging for allowing the pregnancy to continue to the full period of gestation. It would seem that the operation at the seventh month should give more

¹ This can also be accomplished by the total extirpation, with only a line of suture in the peritoneum in the floor of the pelvis.

favorable results to the mother and scarcely less to the child, as the mortality to the latter is already thirty per cent. The cases reported by Dr. Thad. A. Reamy, of Cincinnati, Dr. William J. Taylor, of Philadelphia, Dr. Henry B. Stehman, of this city, Dr. Chrobak, of Vienna, and the case here reported are illustrations of the results that may be obtained in early hysteromyomectomy where the tumor is complicated by pregnancy.

WHAT AUSTRALIANS DIE OF.

BY J. STEELE ROBERTSON, M.D.,

Secretary of the Medical School, University of Melbourne, Australia.

LET me state at once that I here use the word Australia in the sense in which we, on the spot, generally use it. Most geographers restrict the name Australia to the continent proper, and use the word Australasia as a collective name for the Australian continent, Tasmania, New Zealand, British New Guinea, the Fiji Islands, Lord Howe, Norfolk, and Pitcairn Islands, and the outlying dependent islets. But when we Australians speak of Australia we generally mean neither the continent Australia nor the group Australasia, but what are known as "the seven colonies,"—to wit, the five mainland provinces of Queensland, New South Wales, Victoria, South Australia, West Australia, and the two insular provinces of Tasmania and New Zealand.

The accompanying map *A* shows the political boundaries of the seven colonies, while map *B* shows the natural divisions of the continent proper,—viz., the *Coast Margin*, the *Murray-Darling River System*, the *Central River System*, and the *Riverless Country*. In both maps the settled portions are shaded.

The populations of the Australian colonies on December 31, 1893, were estimated to be as follows:

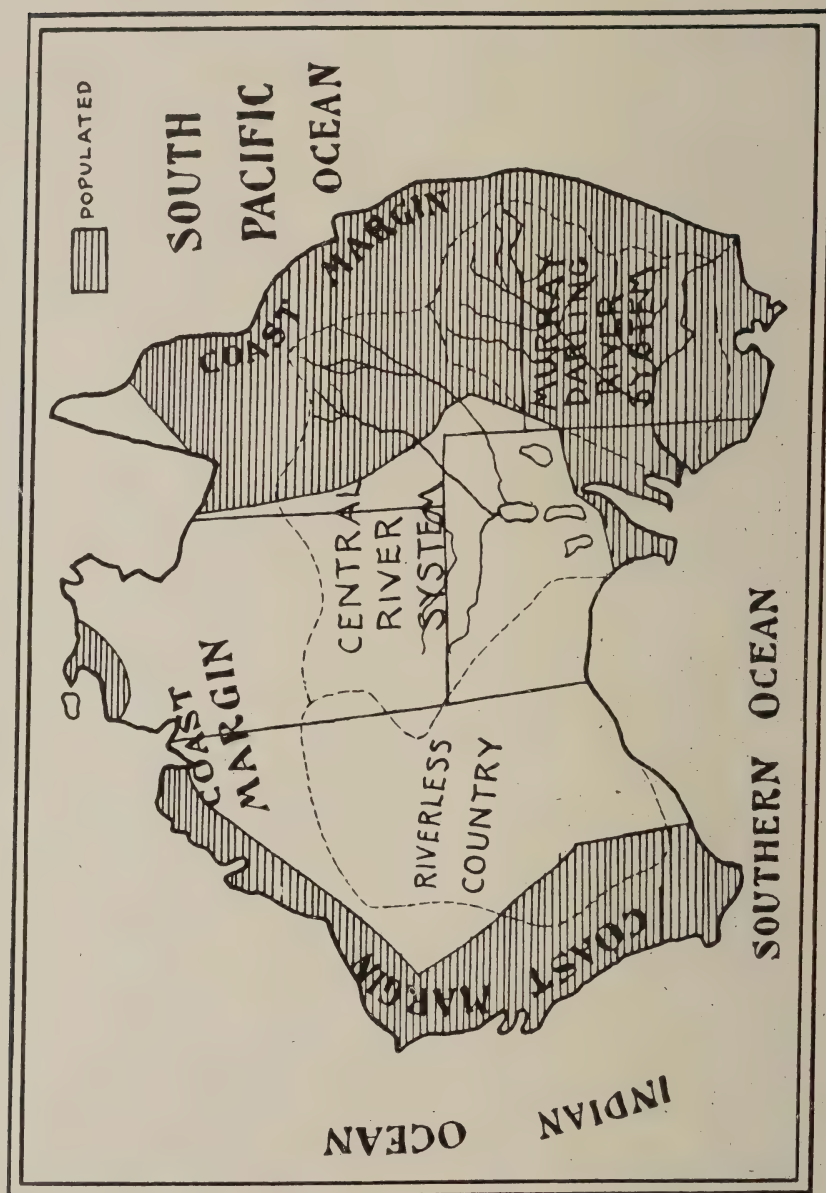
Queensland.....	432,299
New South Wales.....	1,223,370
Victoria.....	1,174,022
South Australia ¹	341,978
West Australia.....	65,064
Tasmania.....	154,424
New Zealand.....	714,258
Total.....	4,105,415

¹ Throughout this paper the Northern Territory of South Australia is treated as if non-existent, because (a) the white population is infinitesimal, (b) nothing of any value is known with reference to the vital statistics of the aborigines, (c) the vital records of the Northern Territory which do exist are so fragmentary as to be practically worthless, (d) the registrar-general of South Australia so treats this province:—J. S. R.



Australia.—Political divisions.

MAP B.



It is not my purpose in this paper to indulge in obscure and tiresome mathematical statements of a decimally exact nature, nor to overwhelm the reader with great quantities of wearisome statistics. My aim is only to give a general outline of the nosology of Australia, based partly on the death statistics of the seven colonies, partly on information given in their year-books and reports, and partly on general knowledge and personal experience.

SALUBRITY.

Tested by the average death-rate for the decade 1884 to 1893, the *ascending* order of the salubrity of the Australian provinces runs thus:

West Australia.....	Death-rate, 16.85 per 1000
Queensland.....	" 15.70 " "
Victoria.....	" 15.37 " "
Tasmania.....	" 14.96 " "
New South Wales.....	" 14.14 " "
South Australia.....	" 13.00 " "
New Zealand.....	" 10.10 " "
Average.....	" 13.95 " "

When these death-rates are compared with those of Europe, we find that during the same decade the average death-rate of the United Kingdom was 18.98, and that of all the countries whose records are available (*i.e.*, the Teutonic and Latin nations) only Scandinavia has an average death-rate for the decade which falls below 18.61. What better testimony to the salubrity of the Australian climate could be afforded?

CAUSES OF DEATH: BY CLASSES.

Considering the causes of death by classes, the usual order of fatality for the seven colonies as a whole is this: local diseases, constitutional diseases, zymotic diseases, developmental diseases, deaths by violence, ill-defined diseases, dietetic diseases, and parasitic diseases. In each separate province, as well as in Australia as a whole, local diseases hold first rank as death-producing agents; but there is nothing strange in that, since local diseases are more numerous than all others taken together. However, the order of fatality in the separate colonies does not always agree with the above table.

In *New South Wales*, *Victoria*, and *South Australia*, the three adjoining southeastern provinces, the order of fatality is exactly the same as the general order given above. This is accounted for by four facts: first, in each the mass of the settled country is in the Murray-Darling River System, the rest being on the Coast Margin; second, the climates agree very closely on the whole; third, the population is here most dense and under very similar conditions; and, fourth, the areas devoted to manufacturing, mining, agriculture, and grazing respectively are, roughly stated, in about the same proportion in each province.

New Zealand, though some twelve hundred miles distant from the mainland and surrounded by ocean, agrees with the general order of fatality, except in respect to deaths by violence, which are invariably more numerous than those from developmental diseases, herein reversing the usual sequence of these two causes.

Tasmania is quite a law unto itself, as an examination of the Bass Straits soundings on an Admiralty chart will prove beyond all cavil, and that although it is only one hundred and fifty miles from Victoria, and, as the physical geographers and hydrographers say, once formed a part of it. The Tasmanian order is: local diseases, developmental diseases, constitutional diseases, zymotic diseases, ill-defined diseases, deaths by violence, parasitic diseases, dietetic diseases. The rise in deaths from developmental diseases is accounted for by the extremely high proportion of deaths from "old age," for no less than seven-eighths of the deaths in the developmental class are from this cause. This fact and the small proportion of deaths from zymotic diseases patriotic "Tassies" point to with pride, as convincing proofs of the geniality and recuperative power of the Tasmanian climate and the purity of its atmosphere. For these Tasmania has to thank its geographical position, its small size, the tempering influence of the surrounding ocean, and the regular alternation of land and sea breezes. The value of Tasmania as a sanatorium is thoroughly recognized on the continent, which is evident from the fact that an immense number of people from the mainland who cannot afford the time or the money for the ocean trip to New Zealand regularly seek every summer a health-giving holiday in "the tight little island." When it is remembered that in Sydney, Adelaide, and Melbourne the daily midsummer temperature is about 100° F., accompanied by hot north winds laden with dust which last three days and which are followed by a thunder-storm, it can be imagined what delight fills the hearts of metropolitans from the mainland when they find themselves in a country which has a pure and genial atmosphere, a temperature 15° to 20° lower than that which they left behind them, and at the close of the day sea breezes which never fail.

While on the subject of the summer temperature on the mainland pardon me an illustration which is a digression. I remember one awful summer, about twenty years ago, when we had in Melbourne a north wind which ceased neither night nor day, and which lasted for seven days. The temperature was over 100° all the time. Suburban residents could not sleep in their houses, but lay out in the open air at night, on any vacant grassy space they could find. The natural accompaniments were epidemics of measles, scarlet fever, and typhoid fever. I sickened with measles myself, and on my way home from school, a few hours before taking to my bed, being under the influence of measles and in the ill-humor occasioned by it, I got into a fight with another boy, was "licked," and lost a good deal of blood. I was down for a week, and delirious most of the time. During my con-

valescence my daily entertainment was to sit at a front window and watch the funerals going by in what looked like one long procession. There were three gates in use at the Melbourne General Cemetery, and the funerals I saw were not going to the gate most used, but to the one second in importance. I remember wondering why the people who had died were all in such small coffins. Our kind old family doctor, on the day he said I might go out for the first time, told me I probably owed my absence from the funeral procession to the extensive bleeding my school-fellow administered to me. He also ordered me to thank that boy for the same the first time I met him. I did. Those funerals had taught me the value of the prompt surgical operation of bleeding.

Queensland, again, has an order of fatality of its own,—viz., local diseases, zymotic diseases, constitutional diseases, deaths by violence, developmental diseases, dietetic diseases, ill-defined diseases, parasitic diseases. The drop from fourth place to fifth in the deaths occasioned by developmental diseases is due to a very large decrease in the deaths from debility, atrophy, and inanition, and this in turn is probably due to the limitation of births, since, as the male population of Queensland is to the female population as four to three, it follows that marriage is necessarily limited because of the lack of opportunity. The fact that the deaths from zymotic diseases are more numerous than the deaths from constitutional diseases is easily understood when we consider that two-thirds of the colony in question is situated within the tropics. The increase in the number of deaths from violence and from dietetic diseases is not to be wondered at in a province where a tropical sun pours down its scorching rays, where the back-country is known as “the Never Never,” and where the largest city outside the metropolis rejoices in the grim alliterative title of “*the City of Sin, Sweat, and Sorrow*.” There is a disproportionate rise in the number of deaths from violence, on account of the frequency of gun accidents, sunstroke, cases of drowning, horse accidents, accidents from too deep pearl-diving, general accidents which are the result of tropical pioneering, and cases of suicide. The cause of the rise in the number of deaths from dietetic troubles is found in a marked increase in the number of deaths that follow privation in the grazing country and “the Never Never,” and in an increase in the number of deaths from alcoholism, chiefly as a result of “sprees” in the towns after long periods of abstinence up country.

West Australia, for the last few years, has been the scene of a wild hunt for gold, and the population is in such an abnormal and unsettled state, and the statistics are so unreliable and so unnaturally disturbed, that no generalizations can be made with any degree of certainty. From 1874 to 1883 the population steadily increased in a normal way, but from that time onward the increase was unnatural and irregular. This can best be seen by means of the following table, in which, to make the statement more graphic and easy to grasp, the numbers have been rounded off by giving the nearest fifty above or below the true number. The table shows

the way in which the population increased from 25,761 in December, 1873, to 65,064 in December, 1893.

1874-83, 10 years.....	Increase, 6000
1884, 1 year.....	" 1250
1885, 1 "	" 2250
1886, 1 "	" 4400
1887, 1 "	" 2900
1888, 1 "	Decrease, 351
1889, 1 "	Increase, 1550
1890, 1 "	" 2600
1891, 1 "	" 7000
1892, 1 "	" 5400
1893, 1 "	" 6400

Such irregularities in increase show that it is due to pathological causes, and not to normal growth, and in the case of West Australia the pathological cause is "gold fever." Another pathological symptom is that, whereas in 1874 females formed six-tenths of the population and in 1884 seventh-ninths, in 1893 the proportion had dropped to a shade over one-half. Any population showing such a record as the above is plainly outside the influence of the law. All that can safely be said of West Australia is that there is a very large floating population engaged in gold-prospecting and mining; that the mining camps have no sanitation, and that cleanliness is at a discount there. Water was for a long time so dear that those who hated grime used to brush the dirt off their bodies, instead of indulging in the luxury of bathing, and once in a while, when they could do without a wet wash no longer, they washed in bottled beer rather than go dirty. Bottled beer was actually cheaper than water. In the hotels and stores water was as dear as whiskey, and neither was cheap. A plunge-bath very often cost more five-dollar pieces¹ there than it would have cost quarters elsewhere. Even now (June, 1895), water at the mining camps costs from ten cents a gallon upward. In the face of all this is it a matter of wonder that in 1893 a serious outbreak of small-pox occurred (forty-nine cases and eight deaths), which was only prevented from spreading further by prompt and effective isolation in a special hospital? Or is it strange that during the latter part of 1894 and the beginning of 1895 typhoid fever simply scourged the mining townships and camps?

CAUSES OF DEATH: BY ORDERS.

The frequency of death has already been considered in regard to classes of diseases. Taking the causes of death now by orders, and only reckoning those classes which have been responsible for the deaths of more than one thousand Australians in 1893, a very fair index to frequency is obtained. The accompanying table well shows the order of fatality and the round numbers of deaths.

¹ Reckoned at five United States dollars to an English sovereign.

1. Constitutional diseases.....	8050
2. Diseases of respiratory system.....	6600
3. Diseases of nervous system.....	5550
4. Diseases of digestive system.....	5100
5. Miasmatic diseases.....	5100
6. Developmental diseases.....	4400
7. Diseases of circulatory system.....	3750
8. Ill-defined diseases.....	3000
9. Diarrhoeal diseases.....	2500
10. Diseases of urinary system.....	1350

INFANTILE MORTALITY.

In the matter of infantile mortality Australia compares very favorably with other countries. The number of deaths in the case of children under one year of age ranges from 12.62 to every one hundred births in Victoria to 9.09 in South Australia. In Victoria the number is over twelve, in New South Wales and West Australia over eleven, in Queensland over ten, and in Tasmania, New Zealand, and South Australia over nine. The percentage in Europe ranges from 31.25 in Würtemberg to 13.19 in Sweden, Norway alone, with 10.49, coming lower. Thus the Australian colonies have lower infantile mortality than any European country except Norway. Infantile mortality is, as a rule, greatest in large towns,—that is, where the population is dense; so that, since Victoria is by far the most densely populated colony in Australia, the same rule will account for its proportionately excessive infantile mortality.

DEATHS FROM OLD AGE.

Connected by contrast with infantile mortality is longevity, and the number of those who attain a ripe old age shows that here again Australia stands well. The returns for 1893 show that in that single year some two thousand six hundred octogenarians had survived the storms and stress of active life, and finally died peacefully in their beds. Minute particulars are not available for all the colonies, so I can only quote a few Victorian particulars. No less than five thousand three hundred and twenty-one persons died in Victoria, during the decade of 1882 to 1891, at ages exceeding eighty years. Of these one thousand one hundred and forty passed their ninetieth year. Out of these veterans twenty just missed their centenary year, while another twenty just completed their century. But thirty-nine succeeded in going further. Seven saw out their one hundred and first year, ten their one hundred and second, five their one hundred and third, and five more their one hundred and fourth, while three just cleared their one hundred and fifth. Four successfully completed one hundred and six years, and two saw out one hundred and seven years. Of the three remaining, a trio of males, one died at one hundred and eight, one at one hundred and nine, and the last belated veteran among veterans lingered on into his one hundred and twelfth year. Of those who passed their eightieth year, but died before completing a century, three thousand

and thirty-one were males and two thousand two hundred and thirty-one were females; and of the fifty-nine centenarians thirty-three were males and twenty-six were females. Of those who succeed in passing their eightieth year, more than half die of that gradual death in life termed "old age." About one-fourth of the remainder die of lung-disease, one-fifth of brain-disease, and about one-fifth more of heart troubles, while the balance surrender chiefly to stomach disease, diarrhœal diseases, kidney troubles, cancer, and accidents. Influenza epidemics also are very trying to the old, carrying off the feeble and accelerating the end of those already diseased.

ZYMOTIC DISEASES OF CHILDREN.

The principal zymotic diseases affecting children are measles, scarlet fever, diphtheria, croup, whooping-cough, dysentery, and diarrhœa.

Measles in its non-epidemic form accounts annually for about 0.52 per cent. of the total deaths, but as an epidemic it is extremely fatal, a severe epidemic causing five per cent. of the deaths for the year, and sometimes more. But these epidemics are few and far apart, the usual interval being from six to eight years.

Scarlet fever usually causes 0.53 per cent. of the total deaths, but the rate has been steadily, though slowly, diminishing for years. Occasionally an epidemic of scarlet fever accompanies, or follows, one of measles. When this happens the fever is far more fatal than the measles. This occurred after and during the measles epidemics of 1866-67 and 1874-75, but during and after the three later epidemics the death-rate from scarlet fever was exceedingly low.

Diphtheria and *croup* are usually reckoned together, partly from similarity of symptoms and partly from the fact that they frequently coexist. They cause, separately or in conjunction, about 3.5 per cent. of the annual deaths.

Whooping-cough is accountable for about 1.5 per cent. of the yearly mortality.

Diarrhœal diseases have a very variable influence on the death-roll from year to year, as the rate rises and falls with the varying temperature, and yet does not have a constant ratio to the temperature.

PHTHISIS.

Except during the prevalence of epidemics, phthisis occasions more deaths by far than any other disease, diarrhœa being usually second. But whereas diarrhœa is usually fatal to infants and young children, the deaths caused by phthisis are chiefly from among the adults. In an average year about nine per cent. of the total deaths are from phthisis. But in all the Australian colonies the deaths from phthisis are materially increased by the deaths of persons who have come to Australia either already suffering from it or predisposed to it. From time to time the compulsory isolation of consumptives has been recommended, as well as means for insuring the

disinfecting of the sputa and all things coming in contact with patients. The other tuberculous diseases taken together also have a very large influence on the death-rate.

TYPHOID FEVER.

The death-rate from typhoid fever has fluctuated considerably ; nevertheless it has well-marked maximum periods, when it causes six per cent. of the yearly mortality. But, on an average, the annual record for typhoid fever is 3.75 per cent. of the total deaths, and as many as thirteen per cent. of the deaths between ten and twenty-five years of age.

SMALL-POX

has never prevailed as an epidemic among the people of Australia. For example, in the last forty-two years in Victoria only twenty-six deaths from this disease have been recorded. Whenever persons sickening from it, or affected by it, have arrived in vessels, or have been discovered among the resident population, such persons have been promptly quarantined or isolated by government order before the disease had an opportunity to spread. Vaccination, also, is compulsory and well enforced throughout the colonies.

LEPROSY.

Lepers are present in all the colonies except Tasmania. The existence of about forty-five has been ascertained, and they are all at the leper stations. About half of these are Chinese, and one-fifth are Europeans, the remainder being South Sea Islanders (Kanakas), Maoris, Javanese, Singhalese, and Australian blacks.

HYDATIDS.

Hydatids in a fatal form appear to be much more common in Victoria than in any of the other Australian colonies, but this may be due to the inaccuracy of medical men in the other colonies, who often enter hydatid cases vaguely on their books as "disease of the liver," etc. Possibly, if more care were displayed in this connection, the annual percentage of the death-roll recorded against hydatids might be higher than the two per cent. and a very small fraction which it averages at present.

CANCER.

Cancer in a fatal form has apparently been fast increasing of late years, for while the deaths in 1885 from this cause numbered 1119, in 1890 they numbered 1653, and in 1891 no less than 1888. Part of this increase is, beyond doubt, due to an increase in the population and other causes,—very likely an increased accuracy in diagnosis of obscure or masked cases, and greater precision in the entries upon death certificates ; but it seems highly probable that a real increase in the frequency of cancerous diseases is taking place in Australia, as elsewhere.

SUICIDES.

About four hundred and twenty suicides are recorded in Australia annually, about 0.8 per cent. of the annual deaths being from this cause. With men the order of preference is hanging, shooting, cutting, stabbing or drowning, and poison. With women it is drowning or poison, stabbing or hanging, shooting. Shooting is on the increase.

CONCLUSION.

From what has been said above it is evident that Australia, as a whole, compares very favorably with other countries in regard to general salubrity. As the settlement of the country increases and spreads, and as artesian wells are opened in the arid interior, a further improvement may be looked for. All over Australia natural hot-beds of diseases are being done away with. In the north the mangrove jungles are being cut away, in the centre the mud lakes are being reclaimed, in the south the swamps are being drained. Legislative interference with noxious trades and municipal drainage-systems is lessening the pollution of rivers, and extension of the powers of health-boards is doing away with buildings unfit for habitation, while building acts insure the erection of more sanitary dwellings. A federal system of quarantine has been instituted, and an assimilation of the health laws and medical acts of the different colonies is progressing. Adelaide and Sydney, the capitals of South Australia and New South Wales respectively, have already admirable water-systems of sewerage, and Melbourne, the Victorian metropolis, is now being reticulated by a sewerage system which will, before it is completed, cost over fifty million dollars. Lastly, Australia has the advantage of being a very young country, and in regard to sanitary matters is making good use of its opportunities.

REDUNDANCY OF RESPIRATORY SURFACE.

BY A. EDGAR TUSSEY, M.D.,

Instructor in Diseases of the Chest in the Philadelphia Polyclinic and School for Graduates in Medicine;
Physician to the Out-Patient Department, Rush Hospital for Consumptives;
Consulting Physician to the Young Men's Christian
Association Gymnasium, Philadelphia.

SOME time ago the author of this article published in the *Philadelphia Polyclinic* a treatise entitled "The Crepitant Râle frequently found in Apparent Health." Since writing the original article he has received from prominent members of the medical profession requests asking for results of further experience and for final conclusions or deductions. During the time intervening between the writing of the first communication and the present contribution ample opportunity for continuing his observations has been afforded to him.

For the benefit of those who may not have seen the first presentation of the subject we shall, as briefly as possible, summarize the principal points of interest. In our examinations of applicants for membership to the central branch of the Young Men's Christian Association Gymnasium we were impressed with the frequency with which we found a fine crackling *râle* which could be heard only during inspiration. To give to it a more serious appearance, the area over which it was heard was not infrequently more or less circumscribed. The presence of a sign which is almost invariably regarded as an evidence of a pathological condition of the alveolar structure of the lungs led to a thorough inquiry and investigation into its significance. Let me emphasize the fact that the character of the *râle* of which I speak, and which is not difficult to detect, could not be distinguished in any way from the crepitant *râle* of the early stage of croupous pneumonia or the *râle* heard in the incipient stage of pulmonary tuberculosis. A *râle* of such a character heard at the apex of a lung would lead us, with almost unerring certainty, to conclude that our patient was suffering from the condition known as incipient tuberculosis. So much for its character. The location in which it may be most frequently found is the region extending from the fifth to the eighth intercostal spaces on the left lateral wall, and with a strong preference for the anterior rather than for the posterior aspect of the region named. The *râles*, however, are not limited to this area, but may be found over the same space in the right lung or in other regions near the base of the chest.

After a most careful series of observations, we have arrived at the following conclusions, which we believe will be found to be correct :

1. Negatively, we note that the *râles* are not inflammatory in their origin or nature.

2. They are not a result of venous engorgement depending upon some valvular lesion of the heart, as no valvular trouble of any kind has ever been found to be present. On the other hand, the individuals in whose chests this sign is found are remarkable for the vigor of their circulation.

3. I have never found it to be a result of pathological changes in the constituents of the blood.

4. It cannot be traced to any disease of the pneumogastric nerve, as we have found no deviation either local or general from the normal type of nervous system.

5. It is not the sequel of an old pneumonic consolidation or of a pleuritic adhesion. On the contrary, the persons who have presented the condition to our notice have been remarkably free from pathological changes of the pulmonary structure.

6. These *râles* may not be traced to any hereditary tendency to tuberculosis, as hereditary influences are very frequently absent.

Those individuals in whom we note this condition of certain areas of the lung are very often remarkable for the beauty and symmetry of their muscular development, for their excellent past history, for their general

vigor when the râles were first noted, for their large vital capacity, for their wide range of chest motion, and for the complete development of the muscles of respiration.

This local condition is found among those in professional life, artists, scientists, and tradesmen, and may not be traceable to any particular occupation, sedentary or otherwise. I take it that their direct cause is a result of a passive transudation of a small amount of the fluid contents of the blood. The real cause of this transudation is the absence of a sufficient amount of air to produce a healthy condition of the circulation over the regions in which it is present. The presence of this local insufficiency of inflation is, without doubt, a result of the individual's having a redundancy of respiratory surface; certain areas, being partially supplemental, are used only to a limited extent. Since these are regions which offer the greatest amount of resistance to the ingress of air, they are, so to speak, laid aside by nature. Since the chest walls cannot expand to a sufficient extent to permit the entrance of air to every portion of the alveolar structure, it enters the apices and the portions which permit the greatest expansion.

To illustrate: An individual has a chest which, upon the fullest degree of expansion possible, will permit the elastic structure within to expand to the extent of raising the stem of a spirometer to two hundred and sixty cubic inches, the two hundred and sixty representing the limit of expansion possible within a chest of certain proportions and diameters. The two hundred and sixty cubic inches does not, however, represent the full number of inches which his elastic sac may contain; it has a capacity of two hundred and seventy cubic inches; ten cubic inches of its capacity has not been registered, nor can it be registered or used until he has developed the capacity of the case in which it is contained and by which its expansive power is limited up to two hundred and seventy cubic inches. Let it be understood that we do not designate as supplementary or redundant any area of vesicular structure which may be called into active use by a complete development of the inspiratory muscles. Any amount of respiratory surface that may be brought into use by a proper training of the chest muscles should not be regarded in any way as a surplus; nature intends us to use it and we are the losers by its inaction. But we have, in the results of our observations on the illustrative cases to which we shall now direct your attention, most conclusive reasons for the statement that nature has given to many individuals an amount of respiratory structure which the development of a large vital capacity and the fullest range of chest capacity and chest motion will not permit them to use. This thought was suggested to me some time ago by my friend Professor Thomas J. Mays, but I was not at that time prepared either to accept it or to reject it. I inclined to the belief that the moist areas which are to be found could be called into use to the extent of at least clearing up the râles. Certain moist areas exist because there is supplemental lung capacity.

Mr. A. presented himself for examination at the Young Men's Christian Association Gymnasium January 15, 1893.

We noted, Professor Chadwick and myself, his fine symmetrical muscular development; we questioned him carefully as to his past history of disease and with reference to the matter of hereditary influences of any kind that might be operative, finding nothing to account for the presence of a large number of well-marked crepitant râles. We excluded everything but the thought that the immediate cause of their presence was a local transudation of serum into partially inflated portions of the lungs; we believed, however, as before stated, that these areas could be made to disappear. We especially ask you to note the fact that Mr. A.'s vital capacity was at that time—two years ago—two hundred and sixty cubic inches and his range of chest-motion three and one-half inches. A short time ago Mr. A. reappeared for examination. We noted the same fine physical development, and found, upon inquiry, that his health since the first examination had been excellent. We were surprised to find that his vital capacity was not increased; his range of inspiratory motion is three and one-half inches, and his chest diameters have both increased.

After two years of training of his chest walls in such a way as to develop them to their highest capacity for work and with the attainment of a muscular development which added to his chest diameters, we find no increase in vital capacity, and the râles may be heard as distinctly as they could be heard two years previously.

Now, since we have been so careful to eliminate any thought of their inflammatory nature, and since we are familiar with the tendency of moisture to exude from the blood under conditions of diminished expansion, is it not a fair deduction to trace this local transudation to partially expanded areas?

We note râles present in the case of Mr. B., who has a vital capacity of two hundred and seventy cubic inches and the almost phenomenal range of five inches of inspiratory motion. Both Mr. A. and Mr. B. are only examples or types of a class with the same history, the same condition of more than average vital capacity, and the same wide range of expansion. The moisture, then, which points to certain areas which are not fully expanded, and such areas being present under such conditions as we have just mentioned, leads us to conclude, then, that the idea of a redundancy of alveolar tissue is in the highest degree probable.

In the process of development which the race has undergone, the changes in the chest walls and in the respiratory surface have not been commensurate, since the fullest range of motion of which the chest walls are capable will not permit the elastic sac contained within to expand to its fullest capacity. From the well-known beneficial effect of certain high altitudes in counteracting certain injurious influences which, in climates of a less elevation, produce a high percentage of consumption, we conclude that, other things being equal, such persons as those who possess this large breathing capacity

are much less liable to contract this disease than others, especially those possessing a small vital capacity and undeveloped chest walls.

In the event of the individuals under consideration becoming the victims of tuberculosis, a change of residence to a higher altitude would certainly be absolutely useless, since there are few people, even in the most lofty climes, who possess a range of motion amounting to more than five inches.

The amount of vital capacity which an individual possesses and the relation existing between vital capacity and range of inspiration have not been given that importance as criteriae for sending patients abroad which they justly deserve. We look upon the ability to properly select cases which would be benefited by being sent to a foreign climate as a most important acquisition to our knowledge of medicine. When we consider the fact that a large number of people are annually sent away from their homes and friends, sacrificing the home care, which they are unable to obtain in distant lands, it behooves us to avail ourselves of every means in our power to advise them wisely. Is it not sad, too, to contemplate the fact that many are sent away to find only a sepulchre in the land in which life and health have been promised to them? It may be considered by some that it is well to inspire hope, if it is only for a short time; but we doubt very much if it is wise that hopes should be borne in the hearts of patients and friends to be so soon doomed to die prematurely. A hope that is like "the dew of the morning strung on tender blades of grass" should not be raised at so great a sacrifice. The mistakes that are so often made frequently react with a very unfavorable effect on the physician's skill. On the other hand, we should not, by a sad lack of knowledge, detain at home dear ones who could have life and health by exchanging a home climate for some distant paradise. Let us see to it, too, that if the bloom of health is to be found in some Elysian field we do not, by our ignorance, rob those who commit their precious lives to our care of the privilege of reaching out their hands to grasp its fragrant blossoms.

We may notice that persons with a very low vital capacity usually have a good range of motion, this range of motion being conditioned by the need which they have for every portion of their respiratory surface. To such patients a foreign field would offer little hope of improvement. Patients with an average respiratory capacity are not so liable to have their respiratory muscles as well developed as the class just mentioned. The demand upon the chest muscles of the latter class is not so great. A high altitude, by developing a greater range of motion, would render much service to this class of patients. We notice that where such a development is altogether possible in the latter case, it is not possible in the former instance. We observe, then, that those individuals who possess large areas of vesicular structure, a large vital capacity, and a wide range of motion have nothing to gain through the medium of diminished atmospheric pressure.

We may readily perceive under what pathological conditions of the heart and lungs a large amount of respiratory surface would be of immense importance to its owner. Such individuals suffering from pneumonia, especially of the croupous variety, pleurisy, or tuberculosis involving a large area would suffer much less from dyspnoea, as the demand for oxygen would be much less urgent. As the reserve force of the heart is called into play when its valves are stenosed or incompetent, so in the diseases enumerated the reserve force of the lungs is called into use and serves a most important purpose. Compensation, so to speak, is established. The balance of the respiration is, at least partially, restored. In the absence of the distressing dyspnoea present in such involvements the draft on the general vitality of the patient is not nearly so great. There is much less danger of cardiac or respiratory failure. In fact, a small amount of redundant structure might make all the difference between life and death. In those cases where the presence of an almost microscopic amount of vitality would carry the heart safely through the struggle or would carry the respiratory centre safely through the conflict and would prevent the patient's dying from exhaustion, some previous training of the respiratory muscles might turn the tide in favor of life. In a time of health we ought to be more careful to prepare ourselves for that conflict with disease through which most of us, sooner or later, are called upon to pass. It is scarcely necessary to say that the "hoary-headed" significance of a fine, crackling, inspiratory râle as a sign of a pneumonic process has long since become a thing of the past; we know that it points in many instances to a widely different condition of the air-cells.

Some of the mistakes in diagnosis which an intimate knowledge of the conditions under which this sign is produced may prevent are the following:

A history of pneumonia, which had occurred six months or a year ago, might lead to the error of regarding these râles as a sequel of the pneumonia. They might be looked upon as a sequel of old pleuritic adhesions. They might be thought to be caused by mitral incompetency or stenosis. Light bronchial hemorrhage of a harmless character might be mistaken for a pneumorrhagia, the râles being taken to indicate the area of hemorrhagic transudation. Strict attention, however, to the conditions which make them significant of the harmless phenomenon which we have just been discussing will help us to avoid all error in the matter.

We do not like to make mistakes if, by any means, we may avoid them. We like to feel that medicine is becoming more and more a science, and that we, as physicians, are becoming more and more scientific in the matter of obtaining results.

It is the earnest hope of the author that this article may be found helpful to the members of the profession.

CLINICAL LECTURES.

CYSTITIS.

LECTURE DELIVERED IN THE MEDICAL CLINIC OF THE BUFFALO GENERAL HOSPITAL.

BY PROFESSOR CHARLES G. STOCKTON.

GENTLEMEN,—The history of this patient is as follows: W. M., aged twenty-two, an American, a laborer by occupation, was admitted sixteen days ago. Family history good. Personal history good until two years ago, when he was troubled with frequent desire to micturate. No pain except when obliged to hold his water. Upon examination, the capacity of the bladder was found to be about sixty cubic centimetres. Urine in twenty-four hours seven hundred and sixty cubic centimetres, strongly alkaline and ammoniacal, urea fourteen grammes, no sugar, trace of albumen, large sediment of mucus, pus, bladder epithelium, and phosphates. The capacity of the bladder at present is two hundred and fifty cubic centimetres. The temperature for the first week ranged between 101° and 99° F., with a tendency downward. Now, a little more than two weeks after admission, both temperature and pulse stand at 100.

The history is a very typical one of a moderate chronic cystitis. The alkaline and ammoniacal urine indicates that there has been decomposition in the bladder, and an inflammation has undoubtedly been present to lead to the presence of pus and possibly of blood. If the man had suffered from urethritis which had extended upward into the bladder, it would be very easy to explain this condition, for many a cystitis has been caused in this way. Sometimes the inflammation may extend to the neck of the bladder and stop, at other times it may extend over the whole surface of the bladder or even follow up the ureters and reach the pelvis of the kidney, producing a pyelitis. It may also invade other organs which are genital rather than urinary and cause an epididymitis, sometimes associated with orchitis. The entire genito-urinary tract may thus be involved. Here we have neither the history nor the indications of gonorrhœa, and we must account for the cystitis in some other way. Cystitis often comes about from a combination of two factors: first, the irritation of the bladder from long retention of urine; second, either at the time or subsequently, a chemical condition of the urine which is itself irritating. The over-distention of the bladder with urine, involving a certain degree of paresis and disturbance of

circulation, often results in a congestion and a weeping of mucus into the bladder. The urine, being irritating, keeps up the over-supply of blood and the over-stimulation. The patient goes about his usual business; lifting, walking, and other motions jar the bladder and render it more sensitive; he is exposed to cold, and a man who has an irritated bladder is highly sensitive to cold; on account of the exposure, a cystitis develops in place of the congestion, and, by a continuance of these irritations, the cystitis may become chronic.

In this case we obtain no history of long retention. The patient says that the trouble has come on gradually, as it is apt to, when the cause is the irritating quality of the urine. You will ask me if cystitis can come about simply from the presence in the bladder of irritating urine? This alone is not likely to establish cystitis. But an exciting cause may be readily supplied, such as exposure to cold, a shock, a strain, or something else which would not be sufficient to produce cystitis without the predisposition caused by the condition of the urine. The state of the man's bladder is at present much better than when he entered the hospital. He passes water now about four times in the twenty-four hours and without burning or irritation. The urine is still highly alkaline. One would suppose from the history that the bladder contained only sixty cubic centimetres of fluid that it was thickened and contracted. A permanently small bladder is the frequent result of chronic cystitis. This is not the case here; however. The bladder has been washed out daily with a saturated solution of boric acid. The urine has been rendered less irritating by the administration of fluid extract of buchu in teaspoonful doses three times a day. The diet, also, has been of a bland character. My directions, in a general way, have been to render the urine neutral in reaction. If it is acid, the patient should have alkalies; if it is alkaline, he should be given some such preparation as benzoic acid. The urine should be tested at every passing to see that it is kept neutral but without crossing the line. The common mistake is made of not examining the urine frequently enough and of substituting a decided acid reaction for a decided alkaline reaction, or *vice versa*.

Whatever is taken into the body must come out in some way; salt, for example, if taken in large quantity, passes out with the urine. If we take into the stomach irritating substances which are eliminated by the kidneys, we must expect to produce an irritation of the bladder. So, too, if any disturbance occurs in the digestive tract, whereby irritating substances may be produced, these substances, passing out in the urine, may irritate not only the bladder but also the kidneys, the ureters, and the urethra. Thus, a chronic Bright's disease may be set up by the prolonged irritating quality of the urine produced by the state of the digestive tract. This relation of the stomach, intestine, and other digestive organs to the kidneys and the urinary passages should be thoroughly understood. It is the relation of the tract through which substances are taken in to the tract through which they are eliminated. It is important, therefore, in a case of this kind, to turn our

attention to the digestive canal. There are other symptoms in this patient which point towards the alimentary canal as a source of the trouble. This young man is anæmic. Whenever you are anæmic, the first thing you should think about, unless the patient has had a hemorrhage or has been starved, is toxæmia; for toxæmia leads to anæmia. Certain micro-organisms in the blood, such as the organism of malaria, of septicæmia, of typhoid fever, of scarlet fever, etc., by producing a toxæmia, lead to anæmia. It is not probable that these micro-organisms generally attack the blood-cells directly, although certain of them do, but the products of their growth, the ptomaines which they form, destroy the blood-corpuscles. Very similar to the ptomaines resulting from the multiplication of bacteria are certain toxic principles formed in imperfect digestion and called leucomaines (Bouchard and Schär), which enter the blood and act on the corpuscles in very much the same way as do the ptomaines.

To continue our investigation of the digestive symptoms which this man presents, we find that his tongue is covered with a coat which is thick and yellow in the middle and thinner at the edges. We may have a coated tongue without digestive trouble, and, on the other hand, we may have serious digestive trouble without any coating of the tongue. Therefore, when you see a clean tongue, do not neglect to examine further for symptoms of digestive disturbance. We must not forget to examine the teeth, and these we find in good condition. A casual inspection shows that the man is thin, and this points to digestive trouble. On percussion, I find that the liver and the stomach lie lower than they normally do. The stomach, I should say, is either displaced downward with all the other abdominal organs somewhat dependent, or else it is dilated. Those of you who are near by can hear a very marked succussion sound when I tap over the stomach with the fingers of one hand without interposing anything as a pleximeter. The percussion note changes a little below the umbilicus as I pass from stomach to intestine. Having the patient lie on his back, I ask him to "work his stomach up and down" by means of the abdominal muscles, and those of you who stand near him can hear distinctly the splashing of the contents of the stomach. With the ear, unaided by the stethoscope, I cannot tell just how far down this splashing or succussion sound is produced, but by using the stethoscope while an assistant suddenly strikes the stomach or while the patient himself draws in and then relaxes the abdominal wall, the range of the succussion sound can be accurately defined. About an inch below the umbilicus stomach resonance gives place to intestinal, but from the other test I know that the stomach goes lower, the gradual change from stomach to intestinal resonance being explained by the overlapping of the colon. From the examination thus far made, I should say that the stomach was dilated rather than depressed, for the succussion sound can with difficulty be obtained from the normal stomach. There are other ways of settling the question. I could administer a solution of soda and then one of tartaric acid, and the carbon dioxide gas evolved would

distend the stomach and mark its boundaries very plainly. But this test I do not wish to apply, as it would interfere with the examination of the gastric contents. I might insert a stomach-tube and pump the stomach full of air. This method, also, I shall not use. Another method is to empty the stomach by means of the tube and then introduce liquid, and either determine the area of the stomach by percussion or by forcing air through the tube beneath the level of the water and listening with a stethoscope to the bubbling of the air through the water. The space over which this sound can be heard affords an idea of the size of the stomach.

The ordinary depth to which the tube should be passed is twenty-two inches from the teeth. If the tube goes down below twenty-two inches, you may safely say that the stomach is dilated or displaced downward. In passing the tube the patient should sit straight without throwing the head back too far, for if the neck is bent backward the patient is sure to choke. The tube is then gradually passed into the stomach, the patient being directed to "swallow hard" whenever he gags. After some difficulty, by shaking and stripping the tube, the gastric contents have been removed undiluted for examination. Now, pouring in water and letting it flow out again, I find a good siphonage at twenty-two inches, and about the same at twenty-four, twenty-six, and twenty-seven inches. Now, filling the stomach fuller than before and siphoning out the fluid, I get what we have not seen before, little particles of meat which have evidently been lodged in the folds of the mucous membrane. The flow stops, but begins again when my assistant pushes the tube down to a depth of twenty-nine inches. We cannot completely drain a stomach by the siphon-tube. We are sure, however, that there have been four pints of water in the man's stomach, perhaps five pints. The weight of so much water—as many pounds—produces considerable discomfort, and unless we are acquainted with the patient and know from past experience the capacity and tolerance of his stomach, it would not be safe to put so much water into it at once. While an assistant has been pouring water into the tube, I have sought, with the stethoscope, the point of greatest intensity of the sound of flowing water, and I find it at a point nearly as low as the pubes. The opening in the tube is twenty-seven inches below the teeth. The condition of dilatation of the stomach is therefore thoroughly demonstrated. An examination of the gastric contents shows that digestion is practically completed, the stomach being nearly empty of food. The reaction is highly acid, but neither hydrochloric nor lactic acid is present, and it is safe to say that the dilatation is not of the type described by Germain Sée, associated with the production of an excess of hydrochloric acid. At 6.30 A.M., four hours ago, the patient had a breakfast of a chop, bread and butter, and milk. The fact that there is now no hydrochloric acid present does not prove that there has been none, for digestion has gone on very well, and, doubtless, the hydrochloric acid secretion has subsided.

BARBER'S ITCH.

CLINICAL LECTURE DELIVERED IN THE JEFFERSON COLLEGE HOSPITAL, JANUARY 6,
1896.

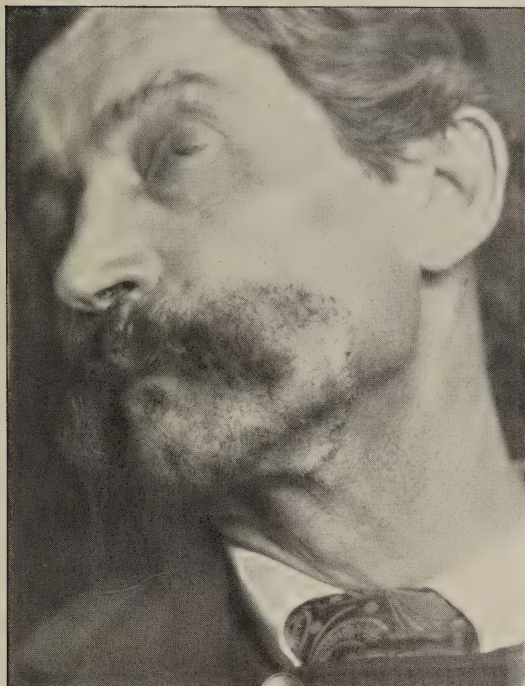
BY HENRY W. STELWAGON, M.D.,

Clinical Professor of Dermatology in the Jefferson Medical College, Philadelphia.

TRUE barber's itch, an example of which is shown in the patient now before you, is a disease of the bearded parts of the face, due to the invasion of the integument by the ringworm fungus. The disease has been, and is still, called variously parasitic sycosis, tinea sycosis, tinea trichophytina barbæ, tinea barbæ, trichophytosis barbæ, and ringworm of the beard. As it is due to the ringworm fungus, trichophyton, the proper technical term would seem to be either tinea trichophytina barbæ or trichophytosis barbæ. In connection with this case I desire to give you a brief description of the several stages or varieties observed upon this region, using a few photographs of cases which have been before you from time to time as illustrations.

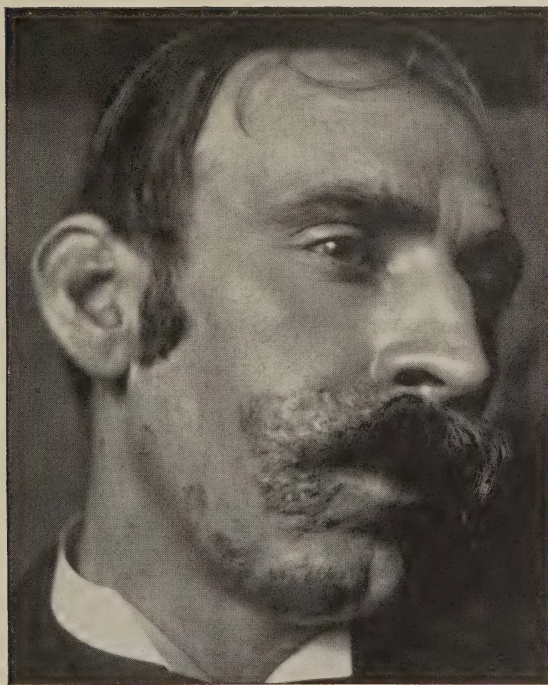
The disease most commonly begins as one or two simple patches of ringworm,—rounded areas with clearing centres and reddened, elevated, slightly scaly, papular, vesico-papular, or vesico-pustular periphery; generally the peripheral portion is merely reddened, elevated, and somewhat scaly. The disease may persist as such, the ring or rings enlarging, possibly one or more new areas arising, the older ones, at times, partly disappearing, while in some patches the infiltration and elevation at the borders become more marked. This constitutes the superficial variety of the disease. This type is not uncommon and may present one large ring-like patch, as seen in Fig. 1, or several or more variously sized ring-like areas or segments, some merely epidermic scaly rings, others more inflammatory and less superficial, the borders being quite pronounced, as portrayed in the photograph just shown. The borders may also show some pustulation. In these cases, if of considerable duration, the hairs are apt to present the same characters as in ringworm of the scalp, some falling out, others, invaded by the fungus, becoming brittle and breaking off, sometimes presenting brush-like ends. As a rule, however, the hair is never so conspicuously involved in ringworm of the bearded parts as in the scalp-disease. In other cases the ring or rings have scarcely time to form before the deeper tissue is involved, and then you see small areas of papulo-tubercles, at first grouped somewhat circularly, later becoming confluent, and sometimes diffused, as in the case before you. (This case is shown in Fig. 2.) In this patient on the chin and the right side of the lower jaw there are several

FIG. 1.



Barber's itch, superficial type.

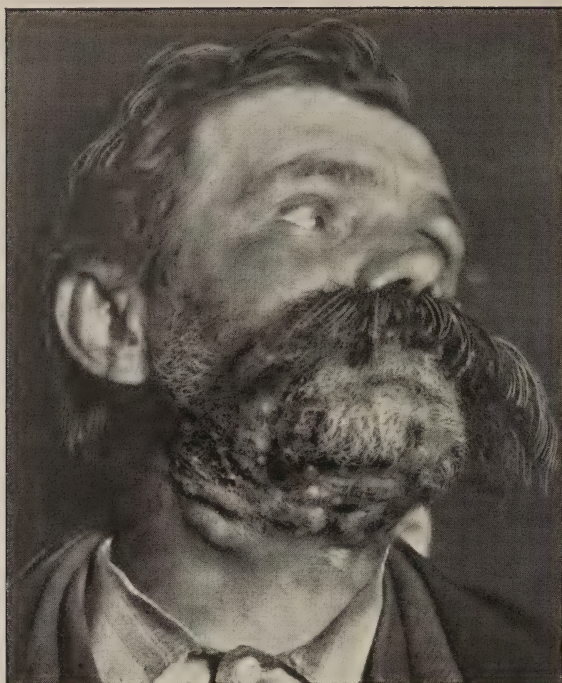
FIG. 2.



Barber's itch, medium type.

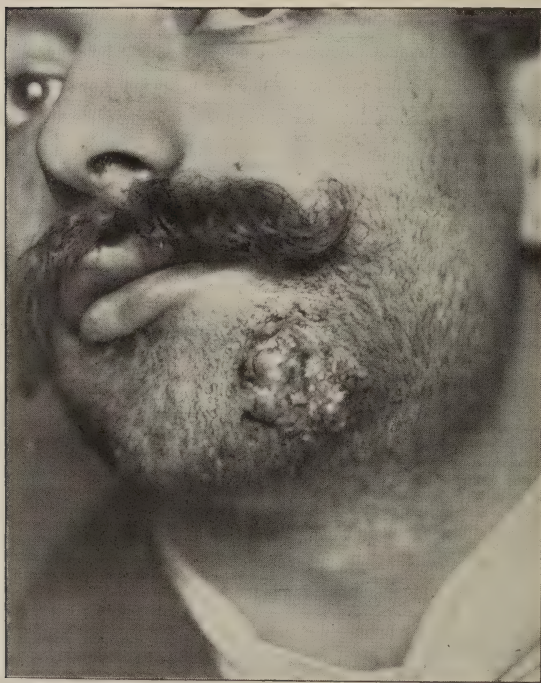


FIG. 3.



Barber's itch, classic nodular type.

FIG. 4.



Barber's itch, circumscribed nodular patch.

distinctly nodular, lumpy, deep-seated areas; those over the jaw still preserving, somewhat indistinctly, their ring-like shape. On the region around the right side of the mouth, invading the upper lip,—an unusual site,—the disease consists of a markedly infiltrated swollen area covered irregularly with pustules; on the other side of the chin are a few nodular infiltrations. The disease began three weeks ago. In other cases the usual beginning stages of the disease are soon lost or even wanting, it rapidly developing into one or several, small or large, sluggish or actively inflammatory, rounded or irregular areas made of deep-seated, distinctly lumpy or nodular masses, resembling somewhat flattened carbuncles; partly covered with pustules and partly showing a glairy mucoid or sero-purulent discharge from many of the follicular openings. The surface may become denuded here and there, and exhibit a tendency to papillomatous vegetations. In this form the hairs, as a rule, soon drop out. This nodular or lumpy type of the disease is the classic type, and is well shown in Fig. 3, the whole under part of the chin and hairy neck being the seat of lumpy, nodular infiltrations. The extent involved is here large; in exceptional cases the disease may consist simply of a single small area, from half an inch to an inch in diameter, and present the appearance of a carbuncle-like abscess, as shown in Fig. 4, a patient exhibited here last winter. I have known the disease in such cases as this last to be viewed as an ill-defined flat abscess or carbuncle, and treated accordingly till the error in diagnosis became self-evident.

The usual sites of trichophytosis barbæ are the chin, under the chin and jaws, the adjacent hairy neck, and the bearded sides of the face; the extent involved, as you have seen, varying considerably in different cases. The upper lip is rarely invaded, even when the disease is quite extensive; in this respect the patient before you is exceptional. Ordinary ringworm patches may coexist on other parts; for instance, as you see, this patient has a typical ringworm patch on the back of one hand; and I may add also that his wife has in the past week developed a patch on the cheek. The several varieties shown in these photographs represent the disease as commonly met with. Almost all the cases are mild and superficial at first; some remain so throughout, others advance slowly, others rapidly, into the true classic, deep-seated, or nodular form. Exceptionally, instead of beginning as one or more simple ringworm patches, ill-defined small areas of superficial or deep pustulation or follicular inflammation first appear, resembling folliculitis barbæ (sycosis vulgaris). Rarely it may begin as a few closely but irregularly grouped papulo-pustules or pustules.

The disease, as you know, is contagious, the trichophyton fungus being the infecting and contagious element. It is not uncommonly contracted in barbers' shops; hence the term "barber's itch." In the large proportion of cases the patient will state that the disease first appeared a few days after being shaved in a strange shop. In other instances it is contracted from a child or children of the family who may have ringworm of the

scalp or upon non-hairy parts; ringworm of the scalp, as our clinic shows, is not at all uncommon. In other cases it is contracted from the lower animals.

As a general rule, there should be but little difficulty in recognizing the disease. In the superficial form the ring-like character is usually diagnostic. This type should not, however, be confounded with the circinate and serpiginous syphiloderm; the latter is slow in its progress, the border more infiltrated and prominent, often showing ulceration, and the central or cleared-up part usually atrophic or scarred. In the deep-seated cases the peculiar lumpy or nodular infiltrated areas can scarcely be confused with any other disease. A single nodular tuberculo-pustular area resembling a carbuncle or flat abscess, already referred to, occurring on these parts should always be viewed with suspicion, and the probability of its being due to the ringworm fungus carefully considered. The history, the falling out of the hair, etc., are also important factors, and not infrequently a characteristic simple ringworm patch will be found to coexist upon non-hairy parts. In doubtful cases microscopic examinations of several hairs from the invaded areas should be resorted to. Simple sycosis (sycosis, sycosis vulgaris, coccogenic sycosis, folliculitis barbæ), with which ringworm sycosis is apt to be confounded, does not present itself in rings, is slower and more insidious in its progress, is usually diffused and superficial and less patchy; the upper lip is frequently involved, either alone or in conjunction with the disease on other bearded parts.

Fortunately, the disease, although often presenting active and repulsive symptoms, is usually rapidly amenable to treatment. All cases are curable, and only in the worst type and in long-neglected cases is there any conspicuous permanent hair loss or other disfigurement. A period of several weeks or several months is required to bring about a cure. After apparent cure a relapse should be guarded against by occasional remedial applications for a few weeks or a month subsequently. The affection being a distinctly local one, constitutional remedies are, as a rule, not prescribed; but in those cases in which the pus-formation is a conspicuous element cod-liver oil, the hypophosphites, or similar nutrient tonics seem to have a favorable influence. An essential part of the treatment should be depilation,—extraction of the hairs from the diseased areas,—especially in the deeper seated types. I am convinced that this procedure will shorten the period of treatment fully one-third and possibly one-half. On unaffected parts the beard should for obvious reasons be kept closely cut. Almost any of the so-called parasitocides will be found efficient, such as ointments of sulphur, of carbolic acid, of white precipitate, or citrine ointment, lotions of sulphur compounds, of mercurials, of carbolic acid, etc. The treatment here has gravitated to two plans, as being the most promising of rapid results,—one a sulphur treatment and the other a mercurial. Both are doubtless equally efficacious, but in some instances when progress is slow or unsatisfactory from one plan a change to the other is found to be of advantage. In the sulphur treatment a lotion of sodium

hyposulphite, one drachm to the ounce, and an ointment of precipitated sulphur of from ten to twenty per cent. strength, are conjointly prescribed. The mercurial plan consists in the use of a corrosive sublimate lotion, from half a grain to two grains to the ounce, together with the employment of an ointment of ten per cent. oleate of mercury, two or three drachms to the ounce of simple cerate, or simple cerate and lard, or, in place of the latter, a white precipitate or calomel ointment, from thirty to sixty grains to the ounce. The plan being selected, the method of carrying it out is as follows: The lotion is applied freely, being thoroughly dabbed over the affected areas and somewhat less liberally over the whole bearded region,—over the latter in order to prevent the infection of new areas; after the wash has dried, the ointment is to be well rubbed in, usually over the diseased places only, but, if there is a decided disposition towards spreading, the ointment as well as the lotion should be applied, once daily at least, to the entire bearded part of the face and neck. The applications should be made morning and evening, and in urgent cases three or four times daily. Before each reapplication the parts should be washed off with warm or hot water, with the use of soap when necessary. Treatment should be continued vigorously till all vestiges of the disease have disappeared, and then, as already stated, intermittently or less actively for several weeks. By this subsequent intermittent or less active treatment the possibility of relapse is reduced to a minimum.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

Special Test for Cancer of the Stomach. (*Medicine*, December, 1895.) By J. A. Wesener, M.D., of Chicago.

The author uses Boas's new method of estimating lactic acid both qualitatively and quantitatively, which depends upon the fact that when lactic or sarcolactic acid is treated with an oxidizing agent acetic aldehyde and formic acid are formed. The oxidation of the aldehyde to acetic acid can be prevented by boiling the solution very gently. The next step in the operation is to treat the aldehyde with iodine and potassium hydrate,

iodoform being produced. According to Boas, a definite quantity of acetic aldehyde will always give a constant weight of iodoform. The author has made this estimation and finds Boas's statement correct. He has also performed the same experiment with lactic acid to determine whether this, when oxidized to acetic aldehyde, would also give a constant weight of iodoform. His results prove that lactic acid can be estimated as acetic aldehyde. The organic products, for example, proteids, carbohydrates, and fatty acids, which, by forming acetic aldehyde, make a source of error in other tests, do not give acetic aldehyde under an energetic process of oxidation. By concentrating the solution upon a water-bath and boiling with barium carbonate the volatile substances are driven off. The lactate of barium is then decomposed with phosphoric acid and the liberated acid removed with anhydrous ether, separated, and evaporated. Both Boas and this writer find that in the normal stomach, and in cases of chronic gastritis, dilatation, atony, and atrophy, an appreciable quantity of lactic acid is not present. In three cases of suspected cancer Wesener found respectively 0.85, 0.75, and 0.13 per cent. of lactic acid. The diagnosis of cancer was confirmed by operation in one and by autopsy in the others. He believes it essential for the formation of lactic acid in the stomach to have some stenosis or other cause of stagnation which gives the lactic acid bacteria the proper medium in which to thrive.

Lateral Curvature of the Spine from the Physician's Point of View. (*Practitioner*, December, 1895.) By Frederic C. Coley, M.D.

The greater frequency of lateral curvature in females may be attributed in great part to muscular weakness produced by chlorosis, which is a very efficient predisposing cause, and to dress, an important factor which is often unnoticed by the physician. In a young girl the growth of the mammæ may make the bodice too tight across the chest long before the garment is worn out; and a kyphosis produced in this way is often perpetuated by fitting the dresses to the girl in her usual stooping attitude. Lateral curvature may be conveniently divided into three stages. In the first, the patient habitually assumes a faulty position, but is able to correct it completely by a voluntary effort; in the second, spontaneous correction by the patient is impossible, but the physician is able to remove the deformity by manipulation more or less forcible; in the third, no possible manipulation suffices entirely to correct the deformity. Four phenomena of lateral curvature—kyphosis, lordosis, lateral deviation, and rotation—are usually combined, though in very variable proportions. Lateral deviation and rotation are said to be always combined; but if this be strictly true, it is certain that they are combined in widely varying proportions in different cases. Sometimes there is marked lateral deviation, with hardly recognizable rotation; and sometimes the rotation is very obvious, while the spinous processes of the vertebræ do not deviate perceptibly from a straight line. The malpositions of the pelvis, due to structural defects, or merely

habitual, are the most important factors in the etiology of scoliosis. Of the structural changes, unilateral congenital dislocation of the hip is a rare one; sacro-iliac disease, recovered from in early life, occasionally produces puzzling deformities of the pelvis; flat-foot is apt to occur in patients predisposed to lateral curvature, and the arch of one foot may yield more than the other, producing what practically amounts to a slight difference in the length of the legs. These structural defects are, however, comparatively rare. Habitual pelvic obliquity due to almost constant use of the "stand at ease" position—i.e., standing with one knee bent, while the other is straight—is a much more common condition. One leg becomes the favorite one for bearing the weight, and the bent limb becomes shortened. A scoliosis due to structural pelvic obliquity does not necessarily go on to the third stage, but a scoliosis due to an obliquity of the pelvis resulting from standing with one knee bent, often does advance to the third stage if not corrected in time. In the treatment, the first requisite will be to remove, if possible, any cause of general debility, especially chlorosis, which is extremely liable to relapse. Very careful and persevering training is necessary to teach the patient to avoid the trick of standing with one knee bent. None of the instruments in ordinary use will overcome the tendency to kyphosis so long as the patient retains the habit of carrying the head too far forward. In severe cases rest for an hour or two in the middle of the day, in the recumbent position, is necessary. The principle of treatment may be summarily stated thus: The patient is crooked; teach her to be straight; and do not stop until you are sure she has learned the lesson. To carry this principle out successfully requires no little care and experience. Moreover, it must be admitted that some patients will not take the trouble to learn.

A Case of Skin-Diphtheria. (*Berliner klinische Wochenschrift*, October 28, 1895.) By Max Müller, M.D.

This rare condition occurred in a child, two and a half years old, who had been burned with hot water on the right side of the face, the neck, the chest, and the abdomen as far as the umbilicus. The burned area healed quite rapidly, and the dressings were removed at the end of one week. At the time that the bandages were taken off the mother of the child playfully kissed it on the neck. On the next day the mother sickened with diphtheria, and a day or two later the aunt, sister, and father were ill with the disease. On the third day, the tender skin on the neck of the child, which had been touched by the mother's lips, showed a white, swollen spot about four centimetres in diameter, bordered by intensely red streaks and surrounded by an cedematous area which soon spread as far as the right eye. Two injections of serum No. 0 were given. The skin soon healed, and the child remained free from infection of the throat. This case has several interesting features. The source of infection is positively known and the incubation period can be accurately estimated.

The Visceral Complications of Erythema Exudativum Multiforme. (*American Journal of the Medical Sciences*, December, 1895.) By William Osler, M.D., of Baltimore.

From a detailed report of eleven cases observed by this writer, and from a collection of fifty more gathered from the literature of this subject, the following manifestations of exudative erythema are cited. The skin lesions were polymorphic, ranging from simple purpura to extensive local œdema, and from urticaria in all grades and forms to large infiltrating hemorrhages of the skin and subcutaneous tissues. In individual cases the cutaneous eruptions were often of the most varied character. Of the visceral manifestations, by far the most common are the gastro-intestinal crises, which consist of simple colic of all grades of intensity, vomiting, and diarrhœa. These symptoms were present in each of the cases reported. Nephritis is the most serious complication. It was found in five of the writer's cases, two being followed by general anasarca and death. In the total number (sixty-one) there were fourteen cases, of which four died. In the mildest grade there is only a trace of albumin with a few tube-casts, while the aggravated cases present all the symptoms of acute hemorrhagic nephritis. In rare instances the nephritis becomes chronic. Hemorrhages from the various mucous membranes were present in five cases of the series. Hæmaturia was present in three cases; hemorrhage occurred from the bowel in three cases, from the stomach in two cases, from the lungs in two cases, from the nose in three cases. One patient had spongy and bleeding gums. Hemorrhage from the bowels is the most common, and occurred in thirty-nine of the total sixty-one cases. Cardiac complications were not present in the cases detailed. In one case there was a heart murmur which quickly disappeared. Endocarditis occurred in two cases in the total series. Pericarditis occurred in three cases. The respiratory organs are less frequently involved. In one of the writer's cases there were recurring attacks of cough and bronchitis without fever. In another pneumonia followed the disease and proved fatal. Perhaps the most extraordinary and distressing feature of the disease is the tendency to recur, which is so noticeable in all types of exudative erythema. In only one case of the eleven reported was the attack single. In the others there were multiple outbreaks distributed over periods ranging from two months to eight years. Arthritis was present in five cases of the series, and in thirty-two of the collected cases. The chief part of the swelling is often due to effusion in the tendon sheaths about the joints.

Diseases of the Mouth, Nose, and Throat as Etiological Factors in Chronic Glandular Gastritis. (*New York Medical Journal*, November 23, 1895.) By Fenton B. Turek, M.D.

This author has made investigations concerning the relation between chronic naso-pharyngitis and chronic glandular gastritis. He uses the gyromele for obtaining cultures from the different areas of the nasal cavity

and from the stomach. This instrument consists of a cable to which is attached a sponge encased in a sheath, which is exposed when it reaches the desired part, and revolutions produced which remove material from the walls. He finds a marked difference in the number and appearance of micro-organisms found in the anterior nares, the nasal chamber, and the post-nasal cavity. In the anterior nares the germs were not found in colonies, but seemed to be simply arrested at that point. In the nasal chamber but few germs were found, while in the post-nasal cavity, where chronic inflammations existed, almost pure cultures were found.

Conclusions : First, clinical observation in many cases indicates a marked relation between diseases of the mouth and post-nasal cavity and chronic inflammation of the stomach and intestines ; second, the invasion of the stomach from the infected mouth and pharynx is supported by the fact that many of the known pathogenic micro-organisms present the same biological and morphological forms in cases of gastritis as the micro-organisms found in diseases of the mouths and post-nasal cavities of the same patients.

The Relation between the Specific Gravity of the Blood and its Hæmoglobin Percentage. (*Medical News*, December 21, 1895.) By F. C. Bush, B.S., and A. T. Kerr, Jr., B.S., under the direction of Herbert U. Williams, M.D., of Buffalo.

After extended observations on the relation of the percentage of hæmoglobin in the blood to its specific gravity, these authors conclude, first, that the percentage of hæmoglobin in blood, in most cases, may be predicted from the specific gravity with sufficient accuracy to be valuable for clinical purposes ; second, Fleischl's hæmometer is liable to an error of ten per cent. ; third, Gowers's instrument is liable to an error even greater than that of Fleischl's ; fourth, that the error in technique with the specific gravity method is likely to be very slight ; fifth, in following up a case with Fleischl's or Gowers's instrument, very erroneous conclusions may be drawn. Mistakes may be made of five per cent. or ten per cent. too low one day, and five per cent. or ten per cent. too high on another day ; sixth, in following up a case the specific gravity estimation seems to give very slight error, and even if from it the absolute percentage of hæmoglobin could not be determined, yet the relative increase or decrease of hæmoglobin from one day to another might be quite accurately estimated ; seventh, because of its being based on the instrument of Fleischl, Hammerschlag's table is, of necessity, only approximately correct.

The Importance of Frequent Observations of Temperature in the Diagnosis of Chronic Tuberculosis. (*Boston Medical and Surgical Journal*, December 19, 1895.) By Walter Channing, M.D.

The writer reports an interesting case of chronic tuberculosis for the purpose of calling attention to the importance of making careful observations of temperature as an aid to diagnosis in obscure forms of disease

with an absence of marked physical symptoms. The patient, a woman, thirty-nine years of age, had suffered with chronic melancholia, accompanied by periods of violent insanity for two and a half years, previous to the time of her entrance into the hospital. She was then very languid and listless, showing loss of mental vigor and an undue degree of depression and diminished power of perception of her condition and surroundings. An attack of diarrhœa with fluctuating temperature lasted for some weeks. A tumor, apparently ovarian, was found on the left of the uterus and was firmly held in place by inflammatory adhesions. The most striking datum from the start was the persistent continuance of an elevation of the temperature, not day by day reaching regularly a certain maximum height, but while usually at night considerably above normal, tending at short and irregular intervals to rise much higher. The temperature was recorded for a period of nearly two years and three months, being taken in the mouth and always by a physician. The total number of observations amounted to fifteen hundred and eighty-two; four hundred and nine times there was a rise to between 100° and 102° F.; eighty-seven times there was a rise to between 102° and 105° F.; thirty-two of these times 102° F. was the point reached; twice 105° F. and several times 104.4° F. was reached. When there was no excessive rise for some time the daily fluctuations would be greater. Chronic tuberculosis was the only diagnosis which could account for the symptoms. The anatomical diagnosis was: Tuberculosis of the ovaries and tubes, with formation of pelvic abscess with perforation into the rectum. Tuberculosis of mesenteric glands and liver. Chronic peritonitis with adhesions. Chronic passive congestion and ascites, probably due to compression of vessels by peritoneal adhesions. Anæmia; marasmus. The characteristic temperature-curve of chronic tuberculosis could be charted by careful observations in a considerable number of cases. The following points gathered from the case cited are significant: 1, an average considerably above normal; 2, an almost invariable rise at night; 3, periodicity of a maximum elevation of several degrees, occurring at irregular intervals of a few days; 4, gradual ascent to the maximum for two or three days, with a decline sometimes gradual, sometimes sudden; the ascent at night, the decline in the morning; 5, protracted continuance of a high temperature for months and years; 6, less constitutional reaction from the periodical rises of several degrees than would be expected.

The Heart in Anæmia. (*Medical News*, December 7, 1895.) By Delancey Rochester, M.D.

The symptoms of anæmia that may be referred directly to the heart as their source are shortness of breath, palpitation, and pain in the præcordial region upon physical exertion or emotional excitement. Physical examination reveals a marked pulsation in the epigastrium and præcordia, the apex-beat is generally in its normal position, or a little below and to the left; the area of cardiac dulness is normal, or slightly increased; the first sound

is short in duration, or may be entirely replaced by a soft, blowing murmur; the second sound is sharp and valvular in quality. Different competent observers have located the cardiac murmur of anæmia at the aortic, the pulmonary, the mitral, and the tricuspid areas. Balfour, of Edinburgh, places the point of greatest intensity one inch and a half, or rather more, to the left of the pulmonary area, and over the part where the appendix of the auricle pops up from behind, just to the left of the pulmonary artery. Hanford has observed that the murmur is usually of greater intensity when the patient lies flat on the back. Most observers agree that the anæmic heart-murmur is systolic in time and basic in situation. The morbid conditions found in the heart in anæmia vary according to the degree and character of the disease, but may be summed up as follows: Laxness and flaccidity of the myocardium with some dilatation of the cavities and some hypertrophy of the left ventricle; fatty degeneration varying from a mild degree of degeneration of some of the fibres of the muscoli papillares, to the severe grade seen in progressive pernicious anæmia. The mechanism of the anæmic murmurs is an interesting and contested point; an explanation of the mode of production applicable to all cases, and which also holds in the case of organic murmurs, is: an obstruction to the onflow of the blood, which is sent through a constricted opening into a larger space beyond, and sounds produced which depend upon the vibrations of, what have been termed by Savant, fluid veins. These sonorous vibrations are transmitted to the surrounding blood, to the vessel walls, and thence to the ear of the listener. At the aortic and pulmonary orifices the blood, in health, is driven with enough velocity against the semilunar valves to press them flat against the walls of the artery; but in anæmia the blood is reduced in weight and allows the valves to hang out into the lumen of the vessel, thus producing the necessary condition and consequent sonorous vibrations resulting in murmur. A rational method of explaining the murmurs heard at the mitral and tricuspid areas was long ago brought forward by Wake, of Dublin. By fatty degeneration, the muscoli papillares were weakened to such an extent as to allow the auriculo-ventricular valves to yield to the pressure of the blood during the ventricular systole, and permit regurgitation to take place. The mitral regurgitant murmur is heard with great distinctness in the area described by Balfour, and for this reason he concludes that the heart-murmur of anæmia is one of mitral regurgitation. The arterial murmur heard in the carotids is synchronous with the cardiac systole, and is a transmission along the current of blood of the cardiac murmur arising at the aortic orifice. The venous murmur, on the contrary, must originate in the vein itself, and here a cause is found for it. The external jugular vein is attached to the clavicle, and its lower part kept constantly extended; just above this somewhat enlarged chamber of the vein is a pair of valves. Owing to the relaxed condition of the walls of the vein in anæmic individuals, and the lack of weight of blood necessary to keep them in place, it is highly probable that these valves hang out into

the lumen of the vessel and produce the necessary obstruction for the formation of the fluid veins of Savant.

Simultaneous Double Aneurism of the Superficial Femoral on the same Side. (*New York Medical Journal*, November 2, 1895.) By Edmond Souchon, M.D., of New Orleans.

The writer reports this case as the first and only one on record of a simultaneous double aneurism of the superficial femoral on the same side cured by ligation alone. It stands the only case of double aneurism of the superficial femoral alone ever cured by any operative measure. The patient, a man, aged forty-three, presented, on admission to the Charity Hospital, an aneurism of the size of a cocoanut, situated at the opening of the great adductor of the left thigh, and another the size of a hen's egg in Scarpa's triangle. All the signs of aneurism and of serious pressure were present. Treatment by elevation of leg, by digital compression, by application of the Esmarch bandage, and by a compress was without effect. The lower tumor grew so rapidly that rupture was imminent, and immediate action was necessary. Ligation of the superficial femoral was decided upon and performed at an equidistance between the origin of the deep femoral and the upper aneurism, a double continuous kangaroo ligature being applied without rupturing the coats of the vessel. Four days after the operation the upper aneurism was found to be pulsating as steadily as ever, and a few days later suppuration of the operative wound took place, followed by hemorrhage. A ligature was then applied to the bleeding upper end of the vessel, which stopped the pulsation again; but it soon returned, accompanied by another hemorrhage. Both ends of the vessel were then ligated and the pulsation ceased. The large, lower aneurism shrank rapidly to about one-third of its original size, and then remained persistent until it was incised, a mass of clots removed, and the cavity drained. The patient became infected with erysipelas somewhat later, but finally recovered. The author concludes from this case: 1. That it is not wise to apply compression over the superficial femoral in cases of tumor of a certain size which may take on rapid growth and force operation through bruised tissues. 2. The ligature should be applied as close to the sac as possible, so as to shut out the collateral branches which cause the return of the pulsation to the upper tumor. 3. Should this operation fail, extirpation of the sac is the next operation in order.

Sixteen cases of double aneurism on the same side have been tabulated by the author. Of these cases eight were cured, one was partially cured, and seven died. Of eight cases of double aneurism of the common femoral and superficial femoral of the same side, or of the common femoral and popliteal of the same side, four were cured by ligation of the external iliac; but in two cases of double aneurism of the superficial femoral and of the superficial femoral and popliteal, it was ligated, and both patients died. The author thinks that the good results following ligation of the

common femoral are due to the fact that an aneurism of the common femoral, by hindering the free circulation of the blood, develops a collateral circulation with the deep femoral through the sciatic and obturator arteries, so that when the external iliac is ligated the parts are more quickly supplied with blood than when it is ligated for aneurism in the course of the superficial femoral.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

Creosote Carbonate in the Treatment of Pulmonary Tuberculosis. (*The Medical News*, December 14, 1895.) By William H. Dukeman, M.D., of Los Angeles.

Creosote carbonate is a non-poisonous and non-irritant preparation of creosote which is completely assimilated, and is capable of being given in doses sufficiently large to produce a general systemic effect with no evil drawbacks. It contains ninety-two per cent. of the purest beechwood creosote chemically combined with eight per cent. of carbon dioxide. The best mode of administering the drug is to drop it into the well-beaten yolk of an egg, which is taken after each meal and before retiring at night. Commence with five-drop doses and add one drop a dose each day until the patient notices a marked improvement. This dose is used for a week or two, and then again increased a drop a day for a week, or until marked signs of improvement again show themselves. Forty-drop doses are as large as have been found necessary. The cases treated were selected, none being in the far-advanced stage of the disease, but showing well-marked objective and subjective symptoms. A careful, systematic trial has been given in each case, every other detail in the treatment as to diet and hygiene being also thoroughly considered. The personal habits of every patient were investigated and all faults corrected. These patients were sent to this climate for their health, and although this factor is no doubt a helpful agent in the treatment of patients with pulmonary tuberculosis in its earlier stages, those under treatment with creosote carbonate show greater gain, of a more strengthening character and of a more permanent nature than those under any other treatment.

The Cigarette Habit. (*New York Medical Journal*, November 30, 1895.) By J. Mulhall, M.D., of St. Louis.

Cigarette-smokers may be divided into those who inhale and those who do not. All real devotees of the cigarette inhale. By a quick respiratory act the smoke is drawn through the larynx into the trachea and into the

first division of the bronchial tubes, but not into the lungs proper. The fact that there is a tidal and a residual air indicates that the smoke does not reach beyond the bronchial tubes. The pleasure in cigarette-smoking, as compared with other tobacco habits, may be said to be a pleasurable irritation of the laryngeal and tracheal sensory branches of the pneumogastric nerve. One absorbs nicotine in accordance with the amount of absorbent surface in contact with the column of smoke. When the smoke-chamber includes the larynx, the trachea, and larger bronchi, there is about three times as much surface for its absorption as when the mouth alone comes in contact with the smoke, and although the cigar contains vastly more nicotine, the cigarette, by inhalation of smoke and by much more frequent use, giving the powerful effect of oft-repeated small doses, is much more dangerous than the cigar or the pipe. The evil effects of cigarette-smoking may be divided into local and constitutional. The constitutional effects are absolutely the same as those of tobacco in any other form. The symptoms are those of nicotine-poisoning. Dr. Ledaux, who analyzed several brands of cigarettes, found no other drug but nicotine in the tobacco, and in the paper a harmless quantity of cellulose. Nicotine is productive of great harm in youth, especially before puberty, when the tender nervous organism is growing. The cigarette presents to the young the greatest encouragement to the use of tobacco, because it does not induce nausea, as only a minute quantity of nicotine is absorbed unless the smoke is inhaled; and nicotine tolerance is usually acquired before inhalation is begun. For the same reason it is used among young women, who, as a rule, do not inhale. The great evil of tobacco is its constitutional effect on the nervous system; the much lesser evil is its local effect on the upper respiratory system. Excluding all other causes and looking at tobacco purely in respect of its local effect, the author denies that it ever causes, as ordinarily used, throat diseases worthy of the name. A trivial hyperæmia and secretion may be caused. The cigarette habit is growing enormously. Nervous diseases and insanity are rapidly increasing among American people. If to such an inheritance American youth adds the nerve-destroying nicotine habit, which the cigarette so materially assists in spreading, there is great reason to hope that the cry of reform may be echoed and re-echoed throughout our glorious country.

The Treatment of Grave Cases of Asphyxia in the Course of General Anæsthesia by Tracheotomy and direct Insufflation. (*Gazette des Hôpitaux*, October 1, 1895.) By Paul Thiéry, M.D.

The author has called attention to this subject in two former articles, in one of which the details of the operation are given. He has treated four cases successfully and two which resulted in failure. This measure has been used only as a last resort, the two fatal cases mentioned being to all appearances dead, the heart-beat having ceased twenty and thirty-two minutes respectively before tracheotomy was attempted. The procedure

might be much more successful if applied quickly, and with decision and coolness. An interesting case, his last successful one, is cited, in which there was a double cause for the asphyxia, œdema of the glottis and chloroform anæsthesia. At the beginning of the inhalation of chloroform the patient had spasm of the glottis and asphyxia with extreme cyanosis rapidly developed. Rhythmic tractions of the tongue were without effect. The extremities grew cold and assumed a cadaverous aspect and all signs of life seemed lost. Tracheotomy was performed and insufflation carried on for four minutes when the integument of the face became slightly tinted, and after ten minutes the respiration became spontaneous. The author concludes that this method should be chosen in all grave accidents from asphyxia, but particularly if due to chloroform anæsthesia. The insufflation should be persevered in; two cases were successful after more than an hour's insufflation. The condition of the pupil is, as in chloroform anæsthesia, the best index to guide the physician. If the pupils are contracted, there is hope of return of life; if they are uniformly dilated, success is possible but not probable.

Conclusions regarding the Effort to use Serumtherapy for Syphilis and Practical Propositions for the Same. (*Wiener medicinische Blätter*, 1895, No. 11.) By E. Spiegler.

The writer gives a critical review of the researches made hitherto on this subject, and himself makes the proposition to inoculate persons in the incubation period of syphilis with blood-serum from individuals suffering with the gummata of an old syphilis. The blood of these patients usually holds enough protective material to shield one from a new syphilitic infection. The placental blood from cases with appearances of tertiary syphilis would also be a proper inoculating material.—*Centralblatt für die medicinischen Wissenschaften*.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D.,

AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the University of Pennsylvania,

Medical Superintendent of the Presbyterian Hospital.

Chylothorax and Chylopericardium. (*Deutsches Archiv für klinische Medizin*, vol. liv., Nos. 4 and 5, 1895.) By Arnold Bargebuhr, M.D., of Hamburg.

The writer has collected twenty-two cases of chylothorax, in which five cases were due to the rupture of the thoracic duct. The etiological factors

were gun-shot wound, one; compression of the thoracic ducts by tumors, one; violence, four; parasites, one; thrombosis of the left subclavian vein, three; non-tuberculous peritonitis, one; sclerosis of the lymphatics, one; carcinoma, four, and one doubtful case; violent exertion, one; thrombosis of the thoracic duct, one; malignant lymphoma, one; and unknown, two. The prognosis is unfavorable, seventeen dying, four being cured, and one unimproved. In ten cases tapping was employed, in one of the patients this being done over ten times. Unless there are marked pressure symptoms this procedure is not advised, as a large amount of nourishment is taken away from the body. The only case of pure chylopericardium is the one put on record by Hasebrock, though in a case of chylothorax described by Fränkel about one-half litre of chylous fluid was found in the pericardium, in addition to that present in the pleural cavity.

The Temperature Curve in Phlegmons. (*Gazette des Hôpitaux*, September 26, 1895.) By R. de Bovis, M.D.

The author divides the curve in phlegmons into three periods: 1. Period of onset. The rise of temperature at this period is well known, and consists of an abrupt or progressive elevation of temperature according to the mode of infection, and rising to 38° C. or 40° C., or even much higher.

2. Period of stadium, fever of inoculation. In this, the pus-forming period, there are oscillations of temperature varying from one to five degrees according to the intensity of the intoxication, the nature and extent of the suppuration, and the time and mode of surgical intervention. An abrupt cessation of general and febrile symptoms is often brought about by the evacuation of pus, and the rapidity of the defervescence may resemble that of pneumonia. In the more serious cases of diffuse phlegmon the temperature generally rises in the evening, or the day following surgical interference. According to the studies of Berneuil and Manoury, this rise is considered as due to the extension of the infectious agent by the dividing of lymphatic vessels and veins during the operation. This fever is called the fever of inoculation.

3. Period of decline, fever of resolution. Usually the temperature falls uniformly and tolerably quickly. Sometimes, however, several abrupt exacerbations take place and the temperature follows an "acute form." In a second class a subacute form is seen, in which there are no chills nor great oscillations of temperature, but a simple exacerbation more or less accentuated, which occurs, perhaps, in the course of one day, or occupying several days for its completion.

Conclusions: 1. Surgical operations on suppurating foci are sometimes followed by a rise of temperature, produced by inoculation of the infection (fever of inoculation).

2. The return of the temperature to the normal is often interrupted by a rise more or less intense, the fever of resolution, caused by the absorption

of the exudate from the cellular tissues, and to this fever a favorable significance is given.

3. These different phenomena are observed in phlegmons of a certain extent or diffuse.

The Influence of Moisture, Warmth, and Antiseptic Dressings in the Treatment of Infected Wounds. (*Deutsche Zeitschrift für Chirurgie*, vol. xli., Nos. 1-3, 1895.) By C. Steinmetz, M.D.

This author was led by his clinical observation of the results obtained in treating infected wounds by antiseptic dressings, and by moist dressings with mild antiseptics, to believe that the moisture and heat produced the favorable results, and that the antiseptic possibly if too strong produced harmful results. The fact is well known that antiseptics, used in sufficient strength to destroy bacteria, are injurious to tissue cells and delay union, and any antiseptic dressing must be changed daily in order to prevent the collection of pus. His study in experiments on dogs, in which wounds were infected by staphylococci, showed that there is no beneficial action from heat and moisture; on the other hand, the action is rather harmful, since a suppurative process, when left to itself and protected from external or mixed infection, has a tendency to become localized, to spread less markedly, and to heal of itself. Under the influence of heat and moisture it spreads itself out and takes on a more virulent character (necrosis). Its action, however, upon healthy tissue is not harmful, and does not produce a tendency to suppuration in the tissues. In infected tissues they, however, act harmfully, producing a spreading of the inflammatory and suppurative processes. The action of dressings cannot be studied when there is a daily changing of them.

The Production of Organic Heart Lesions by Contusions of the Heart. (*Deutsche Zeitschrift für Chirurgie*, vol. xli., Nos. 4 and 5, 1895.) By L. Heidenhain, M.D.

This author, after reporting a very interesting case and a careful study of the literature of the subject and cases previously reported, comes to the following conclusions:

1. Anatomical observations have shown that, in rare cases, the action of a contusing external force, without the presence of a wound or even of a fracture of a rib, may produce a slight contusion of the myocardium, which may continue as a recognizable lesion through life. It is presumable that, as the result of such a contusion, a person surviving the shock may have an insufficiency of the heart produced. (Hockhaus.)

2. As the result of external contusion a rupture of the valves of the left side of the heart may be produced, as has been shown by anatomical and certain clinical evidence, and also by observation on the cadaver. (Barié.) Such an occurrence has not been observed in the right heart.

3. The rupture due to external violence is to be distinguished from

those ruptures due to excessive pressure within the heart which may occur in both sides of the heart from an increase of blood pressure due to great physical exertion.

4. Rupture of the valves can of itself produce only a valvular insufficiency. This is substantiated by the fact that in the great majority of observations made up to this time of rupture of the valves, either from internal or external violence, only an inability to close the valves completely has been established either clinically or anatomically.

5. A rare form, in which a stenosis of the valves followed a contusion in the cardiac region, can be explained only by supposing that there was a subsequent inflammatory alteration of the valves. The observations already made permit the supposition that in such cases we have a chronic endocarditis.

Concerning Fat Emboli. (*Revue de Chirurgie*, No. 7, 1895.) By Guillaume de Groub , of Charkoff, Russia.

This author reports a very interesting case of death due to fat embolism in a patient who had sustained the following injuries: Contusion of the head and face accompanied by a slight amount of cerebral disturbance; comminuted fracture of the clavicle with slight contusion of the pleura and lung, transverse fracture of the sixth and seventh ribs of the left side; oblique fracture of the left tibia; and contusions in various parts with ecchymoses and superficial abrasions. From his personal observation of this case and a careful study of the literature on this subject, the author would draw the following conclusions:

1. Although fatal cases of fatty cerebral embolism are very rare, the danger and possibility of its occurrence should never be lost sight of in cases where there is great comminution of bones or destruction of tissues. This is the only case the author has seen in a wide experience extending over twenty-nine years among grave injuries, and the only patient whom he has lost from this cause, and he does not wish to draw conclusions from this one case.

2. In all cases of extensive injury he advises the examination of the urine for fat every day for three weeks.

3. This determination of the quantity of fat in the urine will give a relative calculation of the amount still remaining in the system: the more that is excreted the less remains behind. A diminution in the amount of fat in the urine accompanied by an increased pulmonary difficulty is an indication of the approach of danger.

4. Difficulty of respiration and lowered temperature are signs which should call attention to the case and put one on guard.

5. The symptomatology of fat emboli and the method of their origin indicate complete rest with fixation of the limb as the best treatment. In compound fractures the dressings should not be changed any more frequently than is positively necessary.

6. Massage should never be employed in recent cases, and in the later stages only when a mass of extravasated blood will not become resorbed.

7. Frequently large sacs filled with blood and liquid fat are caused by contusions. Such sacs should be opened and dressed aseptically; the relief of the tension decreases the danger of embolism and hastens recovery. The same principle is applicable to excisions, and drainage should be allowed for in all such cases, as embolism has followed hermetical occlusion.

8. The danger of fat embolism should weigh in favor of amputation where there is doubt.

9. The excretion of the fat by the kidneys and the action of the heart should be helped by the use of cardiac stimulants and diuretics, especially digitalis.

Juxta-Articular Osteo-Tuberculosis. (*Revue de Orthopédie*, September, 1895.) By Dr. V. Menard.

Although the great majority of the lesions of tuberculous osteitis are those which involve the joint, this author calls attention to the fact that there are many that originate in the extremities of the long bones just outside of the joints, and, if operated upon at a sufficiently early date, do not lead to articular lesions.

He illustrates his subject by the detailed report of ten interesting cases. In regard to the treatment of these foci, they should, in the first place, be recognized early and then subjected to early and thorough operation, since any delay may result in the invasion of the neighboring articulation and destruction of the joint.

If tuberculous arthritis has its seat of origin in the neighboring bones, the greater frequency of tuberculous disease of the hip-joint over that of the other joints of the body is to be explained by the anatomical construction of the part, the neck of the femur lying entirely within the capsular ligament.

The recognition of the presence of such a focus outside the joint at an early day is very important, as if operated upon it will not involve the neighboring joint, whereas, if allowed to remain, it is first detected as a tuberculous arthritis when the joint has already been invaded and partially destroyed.

Hypertrophy of the Prostate; Complete Retention; Double Castration; Cure. (*Annales des Maladies des Organes Genito-Urinaire*, No. 8, 1895.) By Dr. J. Albanan, of Paris.

The author reports an interesting and successful case of double castration for the relief of the hypertrophied prostate in a patient sixty-nine years of age, who for six months had been unable to pass his urine without a catheter and whose testicles showed no trace of utility.

The condition before operation was as follows. The patient had had complete retention on several occasions, at one time requiring two hypo-

gastricappings. The symptoms of increased frequency and retention had been steadily progressive. Examination showed some slight constrictions of the penile urethra, with a history of four attacks of gonorrhœa, while the prostatic portion was elongated. The bladder was not sensitive either when distended to the umbilicus or on contact. Rectal palpation, when the bladder was empty, showed a prostate moderately enlarged, smooth, without irregularities, and yielding to pressure. A soft catheter would not enter the bladder. The urine was turbid, with a small purulent sediment, but there were no tube-casts.

Palpation of the kidney disclosed nothing. The general condition of the patient was mediocre, he had no fever, but a dry tongue and loss of appetite. Antiseptic lavage of the bladder for ten days produced no marked results.

He accepted double castration, which was performed on the 26th of June; the wounds healed by primary union.

The patient urinated spontaneously twenty grammes the afternoon after the operation. Two hundred grammes the next day, four hundred, six hundred, and finally, on the seventh day, fifteen hundred grammes. The residual urine on the eighth day was three hundred grammes, on the eleventh one hundred and eighty, and from the thirteenth to twenty-first one hundred and thirty-five to one hundred and fifty grammes. On the twenty-fourth day it fell to twenty-five, and thereafter varied between sixteen and twenty grammes.

The patient left the hospital on the 26th of July; he was urinating five to six times a day and once at night. There was found to be less than fifteen grammes of residual urine on that day. Rectal examination showed that the prostate had decreased about one-fifth in size. A soft catheter could be easily passed.

On the Influence of Ether and Chloroform upon the Kidney. (*Deutsche Zeitschrift für Chirurgie*, vol. xl., Nos. 5 and 6, 1895.) By D. N. Eisendrath, M.D., of Chicago.

By a careful chemical and microscopic examination of the urine prior to and subsequent to narcosis by ether and chloroform, the author has studied, in one hundred and thirty cases, the relative action of the two anæsthetics upon the kidney, as evidenced by the alteration in the constituents of the urine and their relative amounts before and after narcosis.

He summarizes his study in the following conclusions:

1. Albuminuria that already exists is more frequently increased in amount by ether than by chloroform.
2. Albuminuria follows chloroform narcosis more frequently than ether narcosis; the proportion being thirty-two to twenty-five.
3. On the amyloid kidney their action is similar.
4. Tube-casts either accompanied by or without albumin follow the use of both drugs with equal frequency, but albumin disappears more rapidly

after ether narcosis. This late action has been proven to be more harmful in the case of chloroform than in that of ether.

The author details an interesting case of necrosis of the parenchyma following chloroform narcosis.

Gastrostomy by Frank's Method. (*Berliner klinische Wochenschrift*, No. 80, 1895.) By H. Lindner, of Berlin.

The operation of gastrostomy should be classed, according to this author, with that of tracheotomy, and should be considered as giving relief from the impending death by starvation. If, however, the patient is operated upon before the strength has been wasted, and the vitality reduced by lack of food and loss of digestive power, the value of the operation is greatly enhanced and the result obtained may be of more lasting benefit to the patient. This is especially true of non-malignant strictures, which the author deems curable in the majority of cases, and for whose cure he believes this form of operation most fitted. After an extensive experience with other methods of gastrostomy the author believes this method has produced the best results in cases of malignant strictures. The method consists in an incision, opening the peritoneum, the drawing out of a fold of the stomach as large as possible, the fixation of this fold in the peritoneal opening; a second incision a finger's breadth above the border of the ribs, the undermining of the intervening skin, the drawing through beneath the skin of the fold of the stomach, the opening of the stomach, and suturing of it to the second skin incision. That this operation is no more harmful than the older methods as an operative procedure is shown by the fact that all the nine cases operated upon by the author lived over a week after operation. In addition, the food is retained better and there is no overflow of secretion from the stomach, which in the older operations gave rise to excoriations, necrosis of the edges of the wound, and sloughing out of the sutures, together with a consequent loss of nourishment. There is also no tendency to dilatation of the fistula. In the older operations only one case lived to leave the hospital, while in the nine cases operated upon by Frank's method all the patients lived over the first week. One patient died eight days after operation from peritonitis induced by the inclusion of the omentum in the suturing of the stomach to the peritoneum, as he was greatly depressed when operated upon and his vitality was very low. Two others died, one ten and the other twelve days after operation; the first from pneumonia, and the second from bronchiectatic processes with putrefaction, resulting from chronic bronchitis. Of the six other patients who lived over a week four left the hospital in improved condition. One, who had a stricture due to erosion, was completely cured at the end of one hundred and forty-two days, one at the end of thirty days, one at the end of thirty-seven days, and a fourth, a woman, at the end of thirty-nine days after operation. One of these died at home; the woman has not been heard from, and probably died. One was in good condition

three months after operation. In regard to the technique of the operation the author advises that the stomach be well drawn out, and the fold fixed at its base in the peritoneal opening before the passage under the bridge of skin and the formation of the fistulous opening. This prevents the approximation of the two openings and makes the original position of the fistula permanent.

Operative Treatment of Abscess of the Liver. (*Le Progrès Médical*, August 31, 1895.) By M. Foutan, of Toulon.

M. Foutan has attended forty cases of abscess of the liver following dysentery contracted in tropical countries. He has adopted as rules for operating: first, a free incision, at least eight or ten centimetres long, as soon as the abscess is recognized; second, the final resection of one or more costal cartilages to expose the abscess freely; third, the separate suturing of the peritoneum and of the pleura, to stop the penetration of pus into these serous cavities; fourth, the complete curettement of the cavity of the abscess, an excellent method of removing all the diseased tissue and a method which does not predispose to hemorrhage. The best statistics give, for incision or excision by the bistoury alone, since the antiseptic period, from thirty-seven to fifty-one per cent. of cures. M. Foutan has obtained eighty-six per cent. of cures, a result which he attributes to the operative technique and, above all, to the curettement.

The Symptoms and Treatment of Infective Thrombosis of the Cerebral Sinuses. (*Practitioner*, September, 1895.) By George Heaton, M.B., F.R.C.S.

By infective thrombosis of a cranial sinus is meant a blood-clotting which is the direct consequence of the invasion of the sinus by infective micro-organisms. This thrombosis may take place in any one of the intracranial sinuses, and may be due to a variety of causes, such as compound fractures of the skull, either involving the entire thickness of the bone or only exposing the diploe, cellulitis or cutaneous erysipelas of the scalp, and anthrax or malignant facial carbuncle. The sigmoid sinus is the most commonly affected, and it becomes so infected by direct extension of disease from the middle ear. Fortunately, sinus thrombosis is a rare complication of middle-ear disease, but the symptoms of the disease, when well established, are definite and clear. It is, however, in its earlier stages that its recognition is apt to be overlooked. Headache is one of the earliest symptoms complained of, the pain radiating from the affected ear, and being the most acute on the affected side. With the headache are occasional attacks of pyrexia, with vomiting and rigors. The rigors may be extremely severe, the temperature often rising as high as 106° F. The alimentary canal shows signs of general disturbance, and when the disturbance manifests itself in diarrhoea the motions are very offensive. This diarrhoea may be due to an effort on the part of nature to get rid of noxious products, or it

may be caused by the swallowing of fetid sputum which has been coughed up from the lungs. In cases uncomplicated by general meningitis the intellect remains clear; but if meningitis should complicate the case we find delirium, excitement, and hypersensitiveness of the various senses. As the case progresses evidences of pulmonary infection manifest themselves: these are stitch in the side, short cough, a patch of dulness towards the base of the lungs, pleural friction, moist râles, and the expectoration of a prune-juice material having a very fetid odor. Occasionally the chief stress of the disease seems to fall on the abdominal viscera, and then the case resembles typhoid fever. The inflammation frequently spreads from the sinus along the mastoid vein, and may cause suppuration of the tissues over the mastoid. Pain and swelling below the mastoid process, extending downward in the course of the internal jugular vein, are much more important symptoms. Such a sign points with almost certainty to sinus thrombosis. Optic neuritis may be present, and if very marked it points to meningitis as a complication. The diagnosis of this condition, when its symptoms are purely of the abdominal type, is to be made from typhoid fever by the presence of pain in the head, rigors, discharge from the ear, and the swelling and tenderness about the mastoid, and by the absence of typhoid spots. From cerebral abscess the condition under discussion is to be distinguished by the prominent rôle the rigors play, by the absence of a slow pulse, of a subnormal temperature, and of gradually deepening coma with paralysis. Acute purulent leptomeningitis is very difficult, and in some cases impossible, to separate from sinus thrombosis. The pains in the head and tenderness and swelling along the course of the internal jugular vein are marked features of the latter condition, while leptomeningitis is accompanied by less severe and less frequent rigors, by delirium, hyperæsthesia of the senses, muscular twitchings, followed by paralysis and unconsciousness. The only plan of treatment which affords any chance for the patient is a prompt opening and cleansing of the diseased sinus and the ligation of the internal jugular vein in the neck. This latter procedure aims to arrest the progress of the thrombus along its most common course, and to prevent portions of the infective clot being carried along into the general circulation. A case is reported which ended fatally, and the notes of the autopsy are given.

On the Calcification of the Tunica Vaginalis as a Complication of Old Hydrocele. Orchidomeningitis Calcificans. (*Journal of Cutaneous and Genito-Urinary Diseases*, September, 1895.) By Roswell Park, A.M., M.D., of Buffalo, New York.

The author reports the case of a man who was a monomaniac, the whole subject of whose thought and worry was a tumor of one testicle. This tumor had been present for eight years, was distinctly hard and nodular, and was the size of a very large orange. The patient was very anxious to have the tumor removed, and wished the operation done without an anæsthetic. Castration was performed without anæsthesia, and the patient

scarcely gave a sign of pain during the operation. There was rapid and complete restoration to health, both mental and physical. The tumor was an ovoid mass about four by five inches; the walls were everywhere tough, and gave one the sensation of an egg-shell. On section the sac wall was found to vary from one-eighth to one-quarter of an inch in thickness, and to be calcareous throughout. Inside of the cavity there were some eight ounces of fluid, which had evidently been pus. The inner surface of the membrane was lined with the ordinary prophylactic membrane, and was rough and irregular. On one side, in its proper place, were the remains of the testicle, whose walls were much thickened, but not calcareous. At the lower end of the enlarged sac wall were found two cysts containing a cheesy material consisting of cholesterine crystals and fat. The condition is an unusual one, and brings about a state of affairs which might baffle exact diagnosis. It is, of course, well known that calcification may take place in any of the serous membranes. This is almost invariably a calcification, and not an ossification. A search through the literature has been made, which, while it is not exhaustive, shows that calcareous degeneration is not infrequently a sequel of hæmatocele of the scrotum, and thus furnishes another argument in favor of the radical treatment of that condition. It also shows more clearly how errors in diagnosis may arise, and, finally, it furnishes the best possible argument in favor of exploration by incision in doubtful cases, since to treat cases in which the tunic is not permitted to collapse by means of ordinary injections is to invite failure, if not disaster. For such cases as the one reported, the most radical treatment possible—namely, that by complete excision of the sac wall—is the only scientific method, and the only one which gives promise of perfectly satisfactory results. A *résumé* of a second case presenting the condition in a less marked degree is given.

On the Treatment of Fractures near a Joint by Rest, aided by Massage and Passive Movement. (*Edinburgh Medical Journal*, September, 1895.) By A. G. Miller, M.D., F.R.C.S.E., of Edinburgh.

The present methods of treating fractures near a joint are unsatisfactory, because, not infrequently, the injured limbs are stiff and comparatively useless even after a long period of treatment. The cause of this unsatisfactory result is probably the long period of rest maintained for the treatment of the fracture. In the case of fracture near a joint the joint is more or less damaged by the same force that fractures the bone. We have then not a simple fracture, but a fracture plus a sprain. If the limb be put in a rigid apparatus and kept there for some weeks, the fracture is being treated, but the sprain is ignored. This practice has arisen from the fear of non-union of the fracture; but ununited fractures are rare, while stiff limbs are very common. Rest alone does not cause ankylosis; but if a damaged joint is put up in plaster for some weeks it will require as many weeks of massage to make that joint useful after the plaster is removed. If any one

should be nervous about the taking down of a fracture twice a week, he should remember that the proper treatment of a fracture obliges the surgeon to take off the splints several times during the course of treatment. If this may be done once or twice for the benefit of the fracture, why not five or six times? And if the fracture has to be taken down for the purpose of readjustment, why not apply a little massage and careful movement at the same time? The advantages of this combination of rest with massage and passive movement are: 1. Complete rest is provided for the union of the fractured bone, except for a few minutes once or twice a week. 2. Swelling and effusion are got rid of more quickly by the massage. 3. Adhesions are prevented by the passive movements. 4. Union of the fractured surfaces is probably facilitated by the massage. 5. Time is saved.

The author exhibited a patient to the society before which the paper was read, who had sustained a fracture of both bones of the leg and who was treated in the above manner. The result was most satisfactory in five weeks.

The Results Obtained by Radical Operation in Uncomplicated Herniæ by the Position Method. (*Archives für klinische Chirurgie*, vol. I., No. 1, 1895.) By Theodore Kocher, of Bern.

The fact that no death occurred after the radical operation for hernia in two hundred and twenty cases operated upon by this author and reported by Beresowsky, makes it certain, for the author, that any patient who has no pathological change in any vital organ may be told that the radical operation for hernia is not dangerous to life. Kocher's early operation, the suturing of the inguinal canal with buried sutures, gave in eighty-four cases absolutely primary union in seventy-four, the patients leaving the hospital without trusses in nine days on the average. In ten cases, secondary union required an average of thirty-four days to complete the recovery; there were six relapses in sixty-four of these cases examined at a later period, due to defective operating and stitch-abscesses. The author believes all cases operated on properly by this method will be cured if the course of healing is aseptic. Forty-eight cases were operated upon by the author's first form of carrying up of the sac. There was primary union in thirty-eight cases, and stitch-abscesses in ten with discharge of the sutures, and sometimes necrosis and discharge of the sac occurred. Only two cases of relapse were found in thirty-one cases examined subsequently, and they were cases in which suppuration had occurred.

This method, therefore, gives certain results where aseptic healing follows. The author's present modification produces better results, which he believes he has obtained by a different position for the sac, involving less torsion and bending. The results in twenty-nine cases were: primary union, twenty-seven times, obtained in nine days; local suppuration in two cases, with recovery in twenty-seven days. No relapse occurred in twenty-two cases examined at a later date. The method of operation is as fol-

lows: An incision is made extending over the entire length of the inguinal canal and slightly beyond it externally. This incision extends down to the fascia of the external oblique muscle; the cremaster muscle and infundibuliform fascia are divided and the hernial sac is carefully dissected up and separated from the cord. The next step is an incision through the fascia of the external oblique muscle, external to the internal ring and in the line of the inguinal canal. Directed by a finger, passed up through the canal to the internal ring, a pair of curved artery forceps are introduced through the incision, carried through the inguinal canal anterior to the cord, and emerge at the external abdominal ring. The freed end of the hernial sac is then grasped and the sac drawn up through the canal and out through the incision in the fascia of the external oblique. Three sutures are then passed through the sac as it lies upon the surface of the fascia, external to the incision, and above and parallel to the outer part of Poupart's ligament. The first suture includes the edges of the incision through the fascia of the external oblique and the hernial sac as it lies in the incision. The sac is then excised above the third suture. The lower part of the canal is now closed by buried sutures, which, however, do not include the cord, which during the operation is carefully guarded. The results obtained by this method lead the author to conclude that it is not only the right but the duty of every physician to advise radical operation in all cases of inguinal hernia in which extraordinary size, incarceration, or inflammation is not present as a complication, or in which disease of vital organs or weakness or old age does not form a contra-indication.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
New York City,

WM. G. SPILLER, M.D.,
Philadelphia.

Remarks on a Case of Acquired Spastic Paraplegia due to Primary Sclerosis of the Lateral Columns. (*Comptes Rendus Hebdomadaires des séances de la Société de Biologie*, December 6, 1895.) By Drs. J. Dejerine and J. Sottas.

The description given by Charcot and Erb of the symptoms caused by a presumably primary sclerosis of the lateral columns met such favor that the term lateral sclerosis became well known. Every autopsy showed some other lesion, myelitis, disseminated sclerosis, etc., and, until the case published by Strümpell in 1894, no primary sclerosis in these columns had ever been found. Clinicians employed in place of the term implying the supposed organic changes one which expressed merely the chief symptoms, and the name of lateral sclerosis was avoided by many. The case recorded

by Dejerine and Sottas, being, therefore, only the second one on record where true primary lateral sclerosis was found, is of great importance.

The patient had had several attacks of subacute articular rheumatism and had been somewhat alcoholic, but positively denied syphilis. He had had eleven children, of whom three still live. At the age of forty-two sudden weakness of the legs developed, which soon disappeared. Shortly afterwards the legs gradually became again weak and some lancinating pains were experienced. This weakness increased, and ten years after the commencement of his symptoms he entered the hospital of Bicêtre, Paris, and was under the observation of Professor Dejerine for five years. He presented a spastic paraplegia of moderate degree. In repose there was moderate stiffness of the legs with almost complete integrity of the muscular force, excepting a slight paresis of the right leg. Sensation was intact, and there were no fibrillary contractions and no muscular atrophy. The electrical reactions were normal. The patella reflexes were much exaggerated, especially the one on the right side, where ankle-clonus was also present. In walking the legs become stiff, and the gait was typically spastic. Romberg's sign failed. The action of the sphincters was only slightly altered, and there was only a little slowness in micturition, which also required some effort. Death was due to pneumonia.

Sections from the motor cortex, the two internal capsules, the crura, the medulla, and the cord were examined microscopically. Alteration was noticed only in the white matter of the cord; the gray matter was normal throughout, at least by carmine staining no appreciable cellular change was found. There was a very slight sclerosis in the central part of Goll's column in the cervical and cervico-dorsal regions only, and a sclerosis in the two lateral columns. This latter was almost symmetrical and more marked on the right side than on the left. The greatest change was between the fifth and twelfth dorsal roots; here the sclerosis occupied the area of the pyramidal tracts and extended somewhat in advance of these. It was especially pronounced in the portion contiguous to the posterior horns. In the lumbar region the sclerosis was limited to the pyramidal tracts, and gradually diminished downward, and disappeared between the fifth lumbar roots and the first sacral. Above the fifth dorsal segment the sclerosis was less evident, especially on the left side, and in the cervical region it disappeared on the left side at the level of the fifth cervical roots, on the right side at the level of the third.

This sclerosis is due to atrophy of the nerve-fibres with compensatory growth of the interstitial tissue, and is less intense than sclerosis following secondary degeneration. It was not noticed by the naked eye after hardening. Throughout the cord the vessels and meninges and spinal roots were normal. According to the opinion of Dejerine and Sottas, the paraplegia was unquestionably due to the sclerosis of the lateral columns, which was primary. The case differs from Strümpell's, as the sclerosis was not limited to the pyramidal tracts, but extended a little in advance of these, and

was not found above the cervical region, and as the columns of Goll in the cervical and superior dorsal regions showed a slight sclerosis of their central portion.

Acute Meningitis from the Staphylococcus. (*Gazette des Hôpitaux*, December 10, 1895.) By M. Lorrain.

It was at one time supposed that all cases of meningitis were tuberculous. Many investigators have shown the fallacy of this conception, and Netter was able to find the pneumococcus in twenty-seven out of forty-one cases of suppurative meningitis. At present this micro-organism is considered the most common cause next to the tubercle bacillus, and the epidemic form of meningitis is probably due to this. Krause was the first to encounter the streptococcus. The bacillus of Eberth is hard to distinguish from the colon bacillus; each of these has been found. The staphylococcus has been noticed in two cases: the first one, published by Galippe, is questionable; in the second, published by Le Gendre, the staphylococcus pyogenes aureus was seen in the pus of the meninges. M. Lorrain describes a third case, in which the autopsy was made thirty-six hours after death, and the staphylococcus and the colon bacillus were present in the meninges. He considers the infection by the colon bacillus to have been post mortem. No other micro-organisms could be detected.

A Case of Tumor of the Vertebral Column. (*Berliner klinische Wochenschrift*, No. 47, 1895.) By Professor H. Oppenheim.

A child, aged three years, complained of pain in the right arm, and the mother noticed that the hand and fingers were less used; she observed also a diminution in size of the right pupil and of the opening between the right eyelids. After a few weeks weakness developed in the right leg, which later involved the left also, and caused complete paraplegia with vesical trouble. The child could move the shoulder and elbow of the right side with normal power, but the muscles of the hand and fingers were almost completely paralyzed; the movements of the interossei and of the muscles of the thenar and hypothenar eminences failed. The condition of claw-hand, with atrophy, existed. Electrical excitability was much decreased. The reaction of the right pupil was normal, and moderate œdema was noticed on the right side of the face, especially about the eyelids. The patella reflexes were increased, and the legs were stiff. It was not possible to test sensation satisfactorily. No tender points could be found over the vertebræ. The veins of the right upper thoracic region were enlarged.

The diagnosis of some morbid process at the level of the eighth cervical and first dorsal segments on the right side was made. From the investigations of Madame Dejerine-Klumpke, it is well known that the eighth cervical and first dorsal roots innervate the muscles of the thenar and hypothenar eminences, the interossei and the flexors of the hand and

fingers, also that oculo-pupillary fibres pass from the first dorsal root through the ramus communicans to the sympathetic. In individual cases the second and third dorsal roots may take part in the innervation of the dilator muscle of the pupil. Due to the gradual development of the symptoms the diagnosis of a neoplasm was probably correct. Tuberculous spondylitis was thought of, but was considered improbable on account of the symptoms being at first unilateral. The autopsy showed a sarcoma involving the lower cervical vertebræ with metastasis in the lungs. It was a typical case of Klumpke paralysis, and as such the diagnosis of the location could be made with certainty during life.

A New Case of Peripheral Neuro-Tabes. (*Revue de Médecine*, No. 4, 1895.) By Professor J. Dejerine.

Professor Dejerine publishes, under the above title, a new case of the affection described by him in 1883 and 1884, and which is a form of tabes due to peripheral neuritis. A man of forty-two years, who had previously been in good health, had never had syphilis and had not been alcoholic, was attacked by diphtheritic angina. This lasted about ten days when recovery seemed complete. About a month after the beginning of the throat trouble he began to have tingling in the legs, and his gait was less steady; later, walking became still more difficult. Simultaneously sensation in the skin of the feet, legs, and hands was almost entirely lost. After another month the gait was typically ataxic, and the patient was obliged to separate his legs widely in order to stand. He threw his feet forward and outward in walking and brought his heels to the ground first. It was necessary for him to regard attentively the place where he wished to put his foot, and he was obliged to support himself with a cane. He was not able to stand erect with his eyes closed (Romberg's sign). The muscles of the limbs were normal in regard to size and had lost nothing of their force, and there was no trace of talipes. The electrical reactions for both currents were normal. The patella and plantar reflexes were completely lost on both sides. No spontaneous pains were felt in the legs and none of importance on pressure of the nerve-trunks; merely a sense of numbness in the feet, of a sensation as if walking on cotton, was complained of. The objective sensation for all qualities was abolished in the feet and reappeared gradually in examining the thighs. He was able to recognize the positions in which his limbs were placed, but was not able to touch promptly a given part of his body with his finger when his eyes were closed. The same troubles of sensation, though less in degree, existed in the hands; they felt as if covered with gloves. All parts of the face were normal. The sphincters were not affected. The duration of the whole process was about three and a half months. There can be no doubt that the diphtheritic poison was the cause of the trouble, and that it acted on the sensory nerves alone. This form must be distinguished from true tabes by rapidity of evolution, absence of oculo-pupillary phenomena, history of infection, integrity of the sphincters,

etc. Contrary to ordinary neuritis, the nerve-trunks were not sensitive on pressure in this case.

A Case of Cerebral Tumor with Hemianæsthesia. (*Brain*, Parts II. and III., 1895.) By H. J. Mackay, M.D.

The patient was admitted to the hospital complaining of severe headache, inability to walk, giddiness, numbness, and some weakness of the left side. He had had cramps in the legs, chiefly in the calves, and at this time his limbs were stiff and painful. He had never had convulsions or motor spasms, nor had he ever lost consciousness. Numbness had gradually developed in the left side of his body, which was also somewhat weaker than the right. His wife had observed an increasing torpor. He had had severe attacks of vomiting independently of taking food, and had complained of failure of sight. His mental condition was such as is found in that form of sensory aphasia known as word-deafness. Pain was severe in the frontal region, and cranial percussion elicited tenderness over the right temporo-parietal region. Motor power was slightly impaired on the left side, but he had still considerable power in the left hand and in the left leg. There was no rigidity on passive movement and no atrophy. Electrical irritability was diminished for both currents on the left side of the body. Knee-jerks were normal. The right pupil was dilated and did not react to light, left reacted sluggishly. Muscular sense was much impaired on the left side of the body, likewise the sensations of touch, pain, and temperature. The left half of the face was included in the anæsthesia. Normal sensation was recovered about an inch to the right of the mesial line. The sense of smell was much impaired on both sides; the right eye showed optic neuritis, and the left disc could not be examined. There were ptosis and paralysis of the internal rectus on the right side. Hearing was more impaired in the right ear, and taste was affected on both sides of the tongue. He was frequently seen to move all his limbs, raise himself and sit on the side of his bed, but was unable to stand or walk on account of vertigo. The autopsy disclosed a tumor in the right lower temporo-sphenoidal region which involved the middle and lower temporo-sphenoidal convolutions. The right oculo-motor nerve was compressed, but there were no naked-eye changes in the fifth of the left side, nor in the Gasserian ganglion, nor in the eighth of the right side. On the median aspect the right hemisphere was evidently compressed and softened in the hippocampal, uncinatæ, and occipito-temporal gyri, and the medullary matter of the lingual gyrus was softened to the consistency of pulp. The bed of the tumor occupied most of the thickness of the temporo-sphenoidal lobe in its lower two-thirds and its posterior half. The posterior fibres of the internal capsule were not involved. The fibres of the crura and tegmentum showed no visible change. The author refers to the few clinico-pathological cases for the localization of the cerebral sensory areas which have been published. Ferrier, Horsley, and Schäfer have considered the gyrus fornicatus as representing the area of cutaneous sensi-

bility, an opinion shared by Mills, who includes the hippocampal gyrus, the precuneus, and the postero-parietal convolutions. The absence of morbid change in the sensory tracts of the pons, crus, and internal capsule points to the cortical areas involved as the seat of the sensory disturbance. It is proper to associate the anæsthesia with the cortical lesions on the outer and mesial surfaces of the temporal lobe and with the destruction of the adjacent medullary tissue. Disturbance in hearing, especially on the right side, was probably due to intracranial pressure; loss of taste and smell on this side may have been due to the lesion in the hippocampal gyrus, whereas the involvement of the temporal lobe explains the word-deafness.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children,

AND

LAWRENCE S. SMITH, A.B., M.D.,

Instructor in Clinical Gynæcology in the University of Pennsylvania.

Treatment of Eclampsia. Report of One Hundred and Twenty-nine Cases. (*Centralblatt für Gynäkologie*, 1895, Nos. 46, 47, and 48.) By Professor Zweifel, of Leipzig.

The author divides the cases into two groups,—those occurring between April, 1887, and January, 1892, when the expectant treatment was in vogue, and those occurring after January, 1892, on whom the most active treatment was employed. This latter treatment, as advocated by Dührssen,¹ consists in the immediate delivery of every woman after the first convulsive attack, whether before or during labor, incising, if necessary, the cervix, and even the vaginal and retrovaginal septum, the theory being that the rapid emptying of the pregnant uterus is followed in 93.75 per cent. of cases by the sudden cessation of the paroxysms. Professor Zweifel then proceeds to verify this statement from his own experience. The mortality among primiparæ was 16.6 per cent.; that among multiparæ, 5.5 per cent.,—the difference being due to the greater length and difficulty of labor among the former. The mortality among those attacked ante partum was 17.25 per cent., intra partum 14.29 per cent., and post partum 10.5 per cent. These statistics are compiled from eighty-three cases, it being impossible to determine when first attack occurred in the other cases. Of the one hundred and twenty-nine cases, twenty, or 15.5 per cent., were attacked post partum, and of these twenty-two died, or ten per cent. The number

¹ Archiv für Gynäkologie, vol. xliii. p. 159.

of convulsions, the duration of each, and the rapidity with which they succeed each other, have great value as regards prognosis. Also, the condition of the urine and character of the pulse and temperature are worth notice. Every case showed albumin in the urine. If the urine was scanty, of high specific gravity, and tinged with blood, the case was hopeless. A small, rapid-running pulse is not so serious as is a high fever, the higher the fever the worse the prognosis. The cause of this fever Zweifel believes to be, in the majority of cases, a coexisting pyogenic infection, and not muscular exertion and diminished radiation of heat. Considering, now, the results of treatment, the expectant method gave a mortality of 32.6 per cent. in forty-nine cases; the active, a mortality of fifteen per cent. in eighty cases. Zweifel attributes this great difference in results more to other improvements in the treatment than to the forced delivery. The active treatment is based on the theory that the convulsions cease as soon as the uterus has been emptied of its contents in the majority of cases (89-93 per cent.); but a comparison of the cases shows that of twenty-seven cases delivered by Dührssen's method, in fourteen, or fifty-two per cent., the attacks ceased, while in thirteen, or forty-eight per cent., they continued. On the other hand, of the thirty-two cases delivered by the more conservative method, in twenty-two, or sixty-nine per cent., the attacks ceased, while in ten, or thirty-one per cent., they continued. From these figures he concludes that the more radical interference, by the irritation it produces, renders the patient more liable to a continuance of the convulsions. He concludes: "The result of the classification of my cases I condense as follows: that the complete evacuation of the uterus favors the cessation of the eclamptic attacks, and, indeed, the more so the more conservative the method of evacuation has been. On all occasions, when the question of incision arises, the maxim should be, as large as necessary but as small as possible." The article concludes with the following rules for treatment:

1. During labor, finish the delivery as soon as possible, under the administration of an anæsthetic if the os is not dilated; although most authorities advise an expectant plan of action, sanctioning operative interference in exceptional cases only, Professor Zweifel says, "I advise as an axiom, founded on my own experience, the operative completion of labor in every case." He recognizes two methods of procedure in such cases, according as the obstruction is caused by the undilated os alone or by the os and the vaginal cervix also.

2. In the first case the result may be accomplished, as a rule, by the conservative and safer method of dilatation with inflatable rubber bags; in extreme cases, by small incisions that give rise to little hemorrhage.

3. In the case of an eclamptic patient, with the vaginal cervix still contracted and the external os barely admitting one finger, a beginning should be made with the bags. The incisions through the cervix here must be far greater, and one must expect considerable bleeding to follow.

The hemorrhage takes place post partum, and Zweifel employs Bill-

roth's or similar forceps, and a tamponnade of sterilized cotton pledgets after the uterus has been wiped out with sterile gauze.

4. Since one cannot tell beforehand how much blood will be lost in such a delivery, bloodletting should be postponed until the uterus has been emptied. On the other hand, venesection to the amount of five hundred grammes is of advantage if the eclamptic seizures continue, and, in general, where they are accompanied by a hard, tense pulse, even before the delivery, if the conditions correspond to 3, for many older authors have asserted that dilatation is greatly accelerated by venesection.

5. Nothing must be given to the unconscious patient to swallow, but the stomach-tube should be used exclusively, and, as a preparatory step, the stomach should be washed out whenever disturbances of the gastro-intestinal tract may be assumed. Drinks containing citric, tartaric, or acetic acid should be poured into the stomach.

6. As anæsthetics, both chloroform and ether are serviceable, but are to be used only during the operative delivery. Opium and chloral are discarded, as tending to prolong the eclampsia.

7. The most thorough asepsis is here the more desirable as infection prolongs the duration of the attacks.

Palliative Treatment of Gonorrhœal Tubal Disease. (*Medical Record*, December 14, 1895.) By W. R. Pryor, M.D.

The author recognizes the fact that the radical cure of inflamed tissues in which suppuration has occurred can be effected only by the removal of those tissues, especially when the inflammation has occurred within a pre-formed sac. The most rational operation for gonorrhœal tubal disease is removal of the uterus and its appendages, but the nervous sequelæ of such an operation are usually so serious that a surgeon often hesitates to perform it until other less radical methods have failed. Pryor divides his treatment into three classes, according as he has to deal with an acute salpingitis, a recurrent chronic form, or a hydro or pyosalpinx. In cases of acute salpingitis, the first attack with one or both tubes swollen and tender, he cures the uterus very thoroughly to remove the source of future danger in the endometrium. In fourteen out of seventeen cases this was all that was necessary. The three other cases required more radical measures. Cases of recurrent chronic salpingitis are least affected by palliative treatment. The walls of the uterus and tubes have become the seat of fibrous thickening, and the organs themselves are often bound firmly to the surrounding structures. The best that can be done is to curette the uterus, open the posterior cul-de-sac, break up adhesions, and drain the resulting cavity with gauze. For hydro- or pyosalpinx removal offers the only chance of a cure, but as a palliative measure the author cures and packs the uterus, opens the posterior cul-de-sac by a large incision, ruptures the tubes and evacuates their contents, packs and drains the resulting cavities with iodoform gauze. He believes that if future coition could be prevented

eighty per cent. of the cases thus treated would have no reinfection. In all such cases there is no hope of gestation, and the sexual organs are useless; but such palliative treatment is far more acceptable to the patients than the mental and physical wretchedness that follows the radical operation.

Catgut sterilized with Formalin. (*Centralblatt für Gynäkologie*, No. 46, 1895.) By Hans Vollmer, M.D., of Berlin.

The excellent results obtained with formalin in hardening and preserving pathological specimens, and its energetic bactericidal action, led Kossmann to try it as a means of sterilizing catgut in his private hospital in Berlin. As a result of the experiments, it is claimed that catgut wound on spools, soaked in a two-per-cent. aqueous solution of formalin for twenty-four hours, and then kept until needed in a 0.5-per-cent. solution, will be perfectly sterile and retain its strength.

In order to get rid of all traces of formalin, Vollmer advises that the raw gut, cut the desired length, be wrapped singly in filter paper, soaked in two-per-cent. solution of formalin for twenty-four hours, the excess of fluid drained off between two layers of filter paper, the packets placed in a drying oven for a short time at a temperature of 60° C. (140° F.), in order to evaporate the remaining fluid. The gut may then be preserved dry until wanted, when it should be soaked in sterile fluid for a few minutes to render it flexible and ready for use. Catgut thus prepared is strong and durable, pliable but not slippery in the hands, and can be tied readily. Absorption does not begin until the fourteenth day,—a decided advantage. Since February, 1895, it has been used exclusively in the clinic, and has given most satisfactory results.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,

Paris, France.

Blepharitis Trichophytica. (*Annali di Ottalmologia*, xxiii. Fasc. 5.) By Prof. V. Mibelli, of Parma, Italy.

Professor Mibelli has had the exceptional opportunity of studying two such cases. Those afflicted had obtained this curious condition from three other members of the same family, who, in turn, had contracted it from cattle affected with trichophytosis. The eyebrows were unaffected. The presence of the parasite was ascertained by extracting some of the hairs. The chains of spores could be plainly recognized. In the treatment he first employed an ointment of sulphur and salicylic acid and a 1-500 solution bichloride of mercury; but finding no results, he effected an absolute

cure by repeated epilation. He believes that the diagnosis is at times rendered uncertain by the presence of crusts and scales, which prevent the broken and distorted cilia from being seen. He thinks that the condition of those cases which are able to resist invasion to a great degree must be ascribed in part to the infection coming from a lower animal.

Variation of the Pupil dependent upon Pulmonary Disease of Tuberculous Nature. (*Annali di Ottalmologia*, Annó xxiii. Fasc. 6.) By Dr. Rampoldi, of Pavia, Italy.

The author has seen a case in which, with well-marked tuberculosis of the apex of the right lung, there was incomplete ptosis of the right eyelid, myosis, and sluggish iris. With Destrée, he believes that the ocular symptoms may be dependent upon pressure upon the sympathetic nerve by enlargement of the bronchial lymphatic glands.

Atheroma complicating the Operation for Cataract. (*McCaskey's Clinical Studies*, August, 1895.) By Dr. Wheelock, of Fort Wayne, Kansas.

The author most properly thinks that atheroma constitutes an element requiring very careful consideration as a complication in the operation for cataract. He says that the fact that the surface operated on is small does not lessen the fact that structural changes dependent upon defective nutrition may follow the incision made in the cornea; because this tissue must be repaired both by direct blood-supply and indirectly through imbibition, depending upon the location of the wound. He thinks that if the incision lie within the scleral tissue, there is direct repair; if in the corneal tissue wholly, the repair is by imbibition. He believes that the form of destruction following operations on tissue supplied by atheromatous vessels is necrobiotic in type, as, in this form of degeneration, the nutrition is most interfered with in the process of reforming the structural elements. He records two instances of this character, one resulting in panophthalmitis and the other in corneal necrosis.

A Clinical and Experimental Study of so-called Oyster-Shuckers' Keratitis. (*Bulletin of the Johns Hopkins Hospital*, November-December, 1895.) By Robert L. Randolph, M.D., of Baltimore.

As the result of an extended clinical experience and a careful experimental research with this peculiar form of disease, the author arrives at the following interesting and valuable conclusions:

1. Oyster-shuckers' keratitis may be defined as a traumatic keratitis where the injury is produced by a particle of the oyster-shell.

2. The disease is chiefly remarkable for the rapidity with which the cornea undergoes necrosis at the site of the injury, this area of necrosis being usually very small, owing no doubt to the small size of the foreign body. Small foreign bodies of copper, steel, and sand usually produce no

appreciable keratitis, and, even when they lodge in the cornea, commonly require several days to cause a noticeable inflammation. On the other hand, the oyster-shucker presents a marked infiltration of the cornea at the point of injury within twenty-four hours after the accident.

3. This decided reaction on the part of the cornea makes the injury a peculiarly dangerous one when a large area is wounded, or when entrance has been made into the anterior chamber, such conditions in my experience being invariably followed by loss of the eye through panophthalmitis. How often do we see the cornea injured in the same degree by other kinds of foreign bodies and still the vision not entirely destroyed!

4. Bacteriological investigations failed to discover any specific organism, nor did any of the organisms obtained from cases of oyster-shuckers' keratitis manifest any pathogenic properties when introduced into the corneæ of rabbits, with the exception of the pyogenic cocci. It is not likely, then, that the disease is of parasitic origin.

5. The carbonate of lime, of which the oyster-shell is almost entirely composed, was found to possess qualities irritating enough to call forth a keratitis when introduced into the cornea of a rabbit, and it is more than probable that several other chemical ingredients of the shell would be more or less irritating to the cornea.

6. It is certain that bacteria always play a part in traumatic keratitis, but it is evident that in this variety of traumatic keratitis the cornea is rendered especially susceptible to the effects of micro-organisms, by the irritating chemical ingredients of the oyster-shell, notably the carbonate of lime.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

The Bacteriological Examination of Nine Autopsies on Cases of Diphtheria treated with Antitoxin. (*Boston Medical and Surgical Journal*, December 12, 1895.) By Wm. Royal Stokes, M.D., of Boston.

The results of the examination of nine autopsies on diphtheria cases performed at the Boston City Hospital since January 1, 1895, are here given. These were all uncomplicated cases of diphtheria, in which anti-toxin had been administered. The method of examination consisted in making cultures on coagulated blood-serum "slants" from the lung, liver, spleen, kidney, and the blood of the heart.

In all of the cases the bacillus diphtheriæ was found post mortem in cultures from the respiratory tract. In eight of the nine cases there was a well-marked invasion of the blood by the pyogenic cocci. The results in detail are as follows: In five cases the streptococcus was found in the liver, spleen, kidney, and blood of the heart; in one case in the kidney and blood of the heart; and in one case in the spleen. The pneumococcus was found in two cases in the kidney, in one of which the streptococcus was also found in the spleen. In the cultures from one case the only organism present was the bacillus coli communis. In the lungs of all these cases the bacillus diphtheriæ, streptococci, pneumococci, and the staphylococcus pyogenes aureus were found, either alone or in various combinations.

The presence of these organisms in the various viscera enables us to better understand the fatal issue in spite of the antitoxin given; for this agent cannot be assumed to act against any other organism than the bacillus diphtheriæ. As to the occurrence of the latter in the internal organs in these nine cases, it has been found in the kidney in four cases, and once in the heart and spleen respectively.

Cyst-Formation in the Thymus Gland and a Contribution to the Theory of the Dubois' Abscesses. (*Zeitschrift für Heilkunde*, 1894, xv.) By H. Chiari.

This author's observations have led him to conclude that the abscesses of the thymus described by Dubois as characteristic of congenital syphilis, and also those described later by other writers, have not been sufficiently proved. The great resemblance between pus-cells and the small thymus cells, and the presence of small spaces in the tissue of the thymus, make a diagnosis of abscess difficult. He has found in the thymus of still-born children with congenital syphilis numerous pea-sized spaces containing a pus-like fluid which under the microscope appeared to contain pus-cells. These were to all appearances the abscesses described by Dubois. Cysts were also found which contained epithelioid and lymphoid cells, both of which are normal constituents of the thymus tissue. In some places the interior of the cyst was connected with the wall, suggesting the formation of the abscess-like cysts of Dubois by an extension of the connective tissue into the concentric bodies. The author has compared these cases with thirty-three non-syphilitic ones, including foetal, new-born, and older children. The concentric bodies were found in every case. In sixteen the connective tissue extended into the concentric bodies, as in the cases described by Dubois.—*Centralblatt für die medicinischen Wissenschaften*.

Congenital Absence of the Vermiform Appendix. (*University Medical Magazine*, December, 1895.) By John M. Swan, M.D., of Philadelphia.

The specimen was taken from a male subject in the dissecting-room of the University of Pennsylvania. After a careful search no trace of an

appendix could be found. The wall of the bowel presented a perfectly smooth appearance; the serous covering showed no cicatricial tissue indicating previous operation. On examining the cæcum from its internal surface, the ileo-cæcal valve was seen to be normal in situation and appearance. The author considers this a case of congenital absence of the vermiform appendix. On reviewing the literature of the subject, he finds one case reported in which the appendix was absent, in a male child who died four days after birth of intestinal obstruction, the autopsy showing that the small intestine ended in a blind pouch. Wharton reports cases of congenital absence of the cæcum and a portion of the colon, but no case of a well-developed cæcum with absence of the appendix vermiformis. Guitéras has seen one case occurring on the autopsy-table at the Philadelphia Hospital, in which the vermiform appendix was congenitally absent. Kelynaeck states that complete absence of the appendix has been recorded by Ferguson, who reported one instance in two hundred dissections; and also quotes Darwin and Treves as saying that the appendix is sometimes wanting. Taking into consideration the few instances reported in literature, it would seem that the condition is far from common.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

CONTRACT FOR THE SALE OF A PHYSICIAN'S PRACTICE OF WHICH SPECIFIC PERFORMANCE WAS DECREED.

DOCTOR A. had been a practising physician in the town of L. for twelve years previously to February 6, 1888. Doctor N. had commenced the study of medicine with Doctor A., and, after his graduation from the College of Physicians and Surgeons at M., in March, 1885, returned to L. and formed a partnership with his preceptor, Doctor A., for the practice of medicine. At the expiration of a year, the partnership was dissolved, and Doctor N. continued in the practice for himself down to February 6, 1888. Doctor A. also practising for himself until July, 1886. Three years before he had sold out his practice to one Doctor G., stipulating verbally that, at the end of three years, he would cease practising. The purchase of Doctor G. included, besides Doctor A.'s practice, the latter's property in L. valued at fifteen hundred and twenty-five dollars, and Doctor G., for a like consideration, sold the same to Doctor N. Doctor

A., at the end of three years, stopped practising about three months, then, disregarding his agreement with Doctor G., commenced again and continued until February 6, 1888. On the latter date Doctor A. and Doctor N. entered into another agreement, this time in writing, whereby, in consideration of two hundred dollars, Doctor A. covenanted: *First*, That he would not practise as a physician at L., or within eight miles thereof, for a period of ten years. *Second*, That he would use his influence in favor of Doctor N., and remain at L. for three months, so as to prevent opposition. *Third*, That he would not manufacture or put on sale any medical preparation or compound during the ten years. *Fourth*, And for the true performance of the covenants of the contract, bound himself in the penal sum of four hundred dollars.

Doctor N. paid the full consideration, and Doctor A. removed to a distant county, but in less than four years returned to L. and commenced again to practise medicine there. Doctor N. notified him that he was violating his contract, and requested him to stop practice, but Doctor A. persisted; he even sent cards to a large number of Doctor N.'s patients inviting their patronage. Thereupon Doctor N. filed a bill in equity, averring the facts as here stated, and praying an injunction to restrain him from practising at L. in violation of his contract.

The answer of Doctor A. admits the execution of the agreement, and the payment of the consideration; it also admits that he resumed practice in L., and the manufacture and sale of medicine; but sets up a parol understanding or agreement with Doctor N. that he was to return if he paid back the consideration, and averring that the four hundred dollars designated as a penalty in the agreement is liquidated damages, and further averring his readiness and ability to pay the same.

After a hearing the lower court dissolved the preliminary injunction and entered a decree against the plaintiff, basing such decree upon two conclusions: *First*, That the penal sum of four hundred dollars in the contract is to be treated as liquidated damages. *Second*, That the plaintiff had an adequate remedy at law for the breach of the contract.

On the first point, the Supreme Court, after reviewing the authorities, said, "The intent of the parties in most cases, but not in all, will determine whether the sum stipulated is a penalty or liquidated damages. Calling it a penalty is some evidence that it was so intended, but this is overcome if equity demands it shall be treated as liquidated damages. And that, in determining the equities of the particular case, the relation which the sum bears to the extent of the injury provided against, will be considered. That where there are a number of covenants, and the sum named would be payable for a breach of any one of them, even the least, it is a penalty.

"Take now the circumstances under which this agreement was made, and the terms of it, to discover the intent. It is called a penalty, which is some evidence, though slight, that it was so intended. A., by the death of his father, found it necessary to remove and locate in C. County. In con-

sideration of two hundred dollars he covenants not to practise in L. for ten years. He was a physician forty years of age; his practice was well established and valuable to another physician, especially to a young man, who had graduated but a short time before; it was of but small value to A., for he must abandon it and take up his residence in another county, even if he gets nothing for it. Its sole value to the purchaser, however, depends on A. remaining away, in which event it is of very great value. It is of no value at all if A. soon returns. Is it reasonable to suppose that N. intended A. should have the privilege of resuming practice on payment to him of a sum equal to forty dollars per year, about the value of the patronage of a single patient? A. admits, in his testimony, that many of his old patients have come back to him since his return, and he was there less than a year before testifying. The sum is so out of proportion to the whole damages which N. would sustain by a breach of it that it seems to us improbable that it was intended as liquidated damages by him. But, change the action to one for damages, and suppose that N. had brought suit against A. for selling a single phial of medicine for a dime, which A. covenanted not to do, would A. have submitted to a judgment of four hundred dollars in liquidated damages for the breach, or would he have invoked equity to relieve him from the gross extravagance and hardship of the full penalty, wholly out of proportion to the nature and extent of the injury? Or, if he had returned four days before the end of the ten years, and commenced practice, would the four hundred dollars, or at the rate of one hundred dollars per day, have been the liquidated damages for the violation of the covenant? Yet the sum named here is payable for the breach of any one, even the least of these covenants. There is nothing in the nature of the contract or the circumstances attending it which points to an intent of the parties to treat this sum other than what they call it, a penalty.

“While there is much variance in the authorities on this question, the equities of the particular case often determining the construction put upon the language, nevertheless the defendant has shown no equity which should move a court in his favor. He first sold out his property and practice for a large sum to Doctor G., and N. bought from G. Then defendant resumed practice; then again, by the most explicit agreement in writing, he sold to N. and deliberately violated his covenants, to the manifest injury of N., and, on his own showing, he did this because it paid him better to break his contract than to keep it. The equities of the case, therefore, are all with the plaintiff. We hold that the four hundred dollars stipulated is a penalty only. The contradictory parol evidence is without significance, in view of the plain terms of the contract and the circumstances surrounding the parties when they entered into it; we do not attempt to reconcile it, because the contract itself is not ambiguous, and the circumstances under which it was made are undisputed; these are the controlling facts in settling its interpretation.”

As to the second point: the Supreme Court determined that, from the

very nature of this contract, an action at law was a wholly inadequate remedy for its persistent violation during ten years, and therefore equity will specifically enforce performance of it by injunction. And it was accordingly decreed that the decree of the lower court dismissing the bill be reversed at cost of defendant, and the bill be reinstated for further proceedings in the court below to determine the amount of damages sustained by plaintiff between the return of the defendant to L. and the issuing of this injunction; and, further, that an injunction issue restraining the defendant from practising as a physician at L., and within eight miles thereof, until the sixth day of February, 1898, and from manufacturing or putting on sale any medical preparation during the same time.

It is to be observed that contracts of the above kind are technically known and classified as those in *restraint of trade*, and they depend for their validity upon whether such restraint is total or partial. If the restraint is total, the contract is void as against public policy, and cannot be enforced; but if such restraint is partial, and at the same time reasonable and founded on a good consideration, the contract is valid and will be enforced. There are two reasons why a contract in total restraint of trade is void: one is the injury to the public by being deprived of the restricted party's skill and industry; the other is the injury to the party himself by being precluded from following his profession or occupation, and thus being prevented from supporting himself and his family.

BOOK REVIEWS.

MOULLIN'S TREATISE ON SURGERY. Edited by John B. Hamilton, M.D., LL.D.
Third American Edition. Philadelphia: P. Blakiston, Son & Co., 1895.

The very favorable comment accorded to previous editions of Moullin's treatise upon surgery is an evidence that the work is fully appreciated by the profession. In the present edition a considerable amount of new matter has been added and certain rearrangement of subjects has been made. The chapter upon the treatment of wounds is not what we would expect to find. The antiseptic method of wound treatment is fully detailed, but the more popular and more universally practised aseptic method is not mentioned. The value of heat as a sterilizer for instruments and dressings is not alluded to, and these omissions, we think, detract from the value of the work. The illustrations, as a rule, are excellent, but the crude diagrammatic representations of the most important bandages do not add to the artistic appearance of the work. The chapters treating of diseases and injuries of the blood-vessels, the joints, and the intestinal canal are especially thorough and modern with the exception of the article upon typhlitis and perityphlitis. These diseases are briefly considered, and the chapter is certainly not up to the standard of recent articles upon the subject of appendicitis.

The American editor has done much to make the work more useful and popular with American practitioners; this will be noticed if we compare it with the English edition. With the few exceptions we have mentioned the work is an excellent one and can be recommended as a safe guide to modern surgical practice. H. R. W.

TRANSACTIONS OF THE COLORADO STATE MEDICAL SOCIETY. 1895. *Twenty-fifth Annual Convention.* E. R. Axtell, M.D., secretary.

In this volume of five hundred and fifty pages there are fifty-five papers, many of them of the greatest interest. A committee of the society have made an extensive investigation of the history of tuberculosis, especially regarding the influences associated with its contraction in Colorado. Reports for only 1893 and 1894 are made for the reason that outside of the city of Denver absolutely no official records of births and deaths had been made prior to June, 1891, and then but in one place,—Pueblo. In two years one hundred deaths occurred from tuberculosis specified as contracted in Colorado. In one hundred and seventy-three deaths from tuberculosis the place of origin was not specified, while five hundred and thirty-nine cases originated outside the State. Twelve per cent. of all deaths are from tuberculosis, while it would appear that the deaths from indigenous consumption constitute about ten per cent. of all deaths from phthisis. We notice that the population of Denver is rated at 110,000 in 1894 against 125,000 in 1893, a serious falling off for the western capital. Investigations of this kind are of great value in determining the nature of the spread of tuberculosis, and, supplemented as they are in this volume by the valuable contribution of Professor Victor C. Vaughan on the "Restriction of Tuberculosis," much good will result. Professor Vaughan deals largely with the life history of the organism, how the disease is acquired, and how it may be prevented. He rightly believes that there is no evidence that climate gives immunity to this disease. Acquiring tuberculosis and arresting its progress when once acquired are two different things. Professor Vaughan advocates, among other thing, that schools for the instruction of consumptives in the methods of taking care of themselves and preventing the spread of the disease should be established. This would result in lengthening their own lives, in rendering them more comfortable while they do live, and would save many others from infection. These schools should consist of model hospitals where the consumptive would be both patient and pupil. Dr. Vaughan declares that every State should establish one or more hospitals for the education and treatment of its consumptives. G. H.

PREGNANCY, LABOR, AND THE PUERPERAL STATE. By Egbert H. Grandin, M.D. and George W. Jarman, M.D. Philadelphia: The F. A. Davis Company, 1895.

We have carefully read this volume, which is a companion of the "Obstetric Surgery" that we had the pleasure of reviewing when the latter appeared. The present volume is an exposition of pregnancy, labor, and the puerperal state, characterized by the same practical treatment noted in the "Obstetric Surgery."

Part I. considers the differential diagnosis, the duration, and the hygiene or pregnancy; the pathology of pregnancy; and the diagnosis of the presentation and position of the fœtus.

Part II. is a very excellent study of the mechanism of labor, the clinical course of labor, normal and abnormal labor, and the care of the new-born infant.

Part III. is devoted to a study of the normal and pathological puerperium.

The volume is well illustrated by photographic illustrations, all of which are original and well selected. There has been no attempt to present any detailed discussion of anatomy, physiology, or embryology. Since, to-day, practical obstetrics is founded on fact rather than on theory, the authors have wisely confined their

work to the exposition of practical obstetrics. The book's teachings therefore are pre-eminently clinical.

The chapters upon the mechanism of labor, and upon the management of normal and abnormal labor, are clear and concise, and will prove a valuable guide to the student, to whom a well-written and an accurate description of these subjects is essential.

The discussion of puerperal sepsis is remarkably clear, and has no uncertain sound in describing the clinical aspects and the treatment of puerperal infection. The work all through gives evidence of conclusions drawn from the author's experience, and we are sure that the plans of procedure recommended will be found valuable. There are few works on obstetrics that will leave in the student's mind a clearer knowledge of the means by which abnormalities are recognized and promptly treated. We recommend this work especially to medical students and to the rank and file of the profession who wish to avoid all theories and conflicting opinions, but who desire a reliable statement of the course to be pursued with a pregnant patient, or at the bedside of a woman actually in labor or presenting some complication in the puerperal period.

R. C. N.

NOTES ON SURGERY FOR NURSES. By Joseph Bell, M.D., F.R.C.S. (Edin.), Consulting Surgeon to the Royal Infirmary, and Surgeon to the Royal Edinburgh Hospital for Sick Children. Fourth edition, thoroughly revised, with an additional chapter of general advice to nurses. 12mo. Pp. 180. Cloth, 2/6. Edinburgh: Oliver & Boyd, 1895.

This little book is designed to embrace the main points of a course of lectures delivered for twelve years to the nurses of the Edinburgh Royal Infirmary. The style is conversational and the language shorn of scientific words, so that the salient features may be appreciated by the nurse taking up her work for the first time. The examples and explanations are in the same language, and refer to objects of every-day life, so that a beginner may appreciate them. We think, however, for nurses of more advanced standing the language could profitably be made a little more technical and scientific.

The chapter on General Advice to Nurses contains much that is applicable to the nursing profession in this country, although that profession on this side of the Atlantic is situated in so different an environment from the same profession on the other side of the water.

J. M. S.

SPECTACLES AND EYE-GLASSES: THEIR FORMS, MOUNTING, AND PROPER ADJUSTMENT. By R. J. Phillips, M.D., Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic and College for Graduates in Medicine; Ophthalmic Surgeon to the Presbyterian Hospital in Philadelphia, etc. Second edition, revised. 8vo, pp. viii. 17-105, with forty-nine illustrations. Philadelphia: P. Blakiston, Son & Co., 1895.

Both the author and the publishers are to be congratulated upon the success that has attended the reception of this little work.

In a little more than three years' time it has been found necessary to bring out a new edition. Comparison with the first shows that much which is new and useful has been added. Whole pages of fresh matter have been inserted. New material upon such important subjects as the indices of refraction of glass used in spectacle making, designation of lens combinations, and methods of lens enumeration, have all been written upon. A more extended description of the plans pursued in the manufacture of lenses have been added, and an entire revision of the subject of prisms, so as to make it coincide with the present system of notation, has been made. Several new cuts and some useful tables have been inserted in the text.

The reviewer, who has had a most pleasant task given to him in carefully and critically perusing the pages of this little book, can do no better, in expressing his debt of gratitude for the benefit and profit that he has thereby derived, than to unhesitatingly recommend its purchase and study to every practical ophthalmologist who wishes to become conversant with this most frequently-neglected branch of ophthalmic science.

C. A. O.

MANUAL OF GYNÆCOLOGY. By Henry T. Byford, M.D. Containing 234 illustrations. Philadelphia: P. Blakiston, Son & Co., 1895.

The author has prepared this manual of gynæcology to supply the student with a work for study and for reference in his college course, and to be used in the early years of his practice. An attempt has been made to simplify the subject by the use of two kinds of type,—viz., the larger type for essentials to which the student is expected to give his closest attention, and the smaller type for the addition of details that may be of advantage to the young practitioner beginning actual work in gynæcology.

The book is divided into ten parts, as follows: Diagnosis and details of gynæcological technique and treatment; development and anomalies of development; functional and nervous diseases; traumatic lesions of the genital tract; displacements; inflammatory lesions; genital tuberculosis; malignant diseases; tumors of the female organs; and ectopic pregnancy, pelvic hæmatocele, and pelvic hæmatoma.

We have read the book through, and on the whole find it an excellent text-book and a safe guide for those practising gynæcology as a part of their general work. We rather deprecate the use of tents and intra-uterine treatment as advised by the author, especially in the hands of the average recent graduate and of men whose practical knowledge of antiseptic and aseptic details is never sufficient to surround intra-uterine applications with safety.

The chapter upon uterine displacements is excellent. Operation for pelvic inflammatory disease through the vagina is given much prominence, and the cases to which vaginal section is applicable are clearly set forth. The technique of all the important operations for malignant diseases, for uterine fibroids, and for ovarian and parovarian tumors is clearly described and well illustrated. The details of preparation for operation and of the after-treatment are clearly given, and in each case the instruments to be employed and the steps of the operation are fully described. The volume has been carefully prepared by an author of large personal experience, and his directions for the care of gynæcological cases can be relied upon. The book is a useful manual and doubtless will have a wide circulation.

R. C. N.

BOOKS RECEIVED.

W. B. SAUNDERS, PHILADELPHIA.

AN AMERICAN TEXT-BOOK OF SURGERY, FOR PRACTITIONERS AND STUDENTS. By Charles H. Burnett, M.D., Phineas S. Conner, M.D., Frederic S. Dennis, M.D., William W. Keen, M.D., Charles B. Nancrede, M.D., Roswell Park, M.D., Lewis S. Pilcher, M.D., Nicholas Senn, M.D., Francis J. Shepherd, M.D., Lewis A. Stimson, M.D., William Thomson, M.D., J. Collins Warren, M.D., and J. William White, M.D. Edited by William W. Keen, M.D., LL.D., and J. William White, M.D., Ph.D. Second edition, carefully revised. 8vo. Pp. 1248. Cloth, \$7.00; sheep, \$8.00; half Russia, \$9.00.

A MANUAL OF THE PRACTICE OF MEDICINE. By George Roe Lockwood, M.D., Professor of Practice in the Woman's Medical College of the New York Infirmary; Attending Physician to the Colored Hospital and to the City (late Charity) Hospital; Pathologist to the French Hospital; Member of the New York Academy of Medicine, of the Pathological Society, of the Clinical Society, etc. With 75 illustrations in the text and 22 full-page colored plates. 12mo. Pp. 935. Cloth, \$2.50.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY: Being a Yearly Digest of Scientific Progress and Authoritative Opinion in all Branches of Medicine and Surgery, drawn from Journals, Monographs, and Text-books of the Leading American and Foreign Authors and Investigators. Collected and arranged, with critical editorial comments. By J. M. Baldy, M.D., C. H. Burnett, M.D., Archibald Church, M.D., C. F. Clarke, M.D., J. Chalmers DaCosta, M.D., W. A. N. Dorland, M.D., V. P. Gibney, M.D., Homer W. Gibney, M.D., Henry A. Griffen, M.D., John Guit  ras, M.D., C. A. Hamann, M.D., H. F. Hansell, M.D., W. A. Hardaway, M.D., T. M. Hardie, B.A., M.B., C. F. Hersman, M.D., B. C. Hirst, M.D., E. Fletcher Ingals, M.D., W. W. Keen, M.D., H. Leffmann, M.D., V. H. Norrie, M.D., H. J. Patrick, M.D., William Pepper, M.D., D. Riesman, M.D., Louis Starr, M.D., Alfred Stengel, M.D., Thompson S. Westcott, M.D. Under the general charge of George M. Gould, M.D. Profusely illustrated with numerous wood-cuts in the text and 33 half-tone and colored plates. 8vo. Pp. 1183. Cloth, \$6.50; half-morocco, \$7.50.

HUDSON-KIMBERLY PUBLISHING CO., KANSAS CITY, MO.

ANOMALIES OF REFRACTION AND OF THE MUSCLES OF THE EYE. By Flavel B. Tiffany, M.D., Professor of Ophthalmology and Otology of the University Medical College of Kansas City, Mo., etc. Author's second edition. 8vo. Pp. 307.

J. B. LIPPINCOTT COMPANY, PHILADELPHIA.

THERAPEUTICS OF INFANCY AND CHILDHOOD. By A. Jacobi, M.D., Clinical Professor of the Diseases of Children in the College of Physicians and Surgeons (Columbia University), New York; President of the Association of American Physicians; Late President of the New York Academy of Medicine and of the Medical Society of the State of New York, etc. Pp. 315.

WILLIAM WOOD & CO., NEW YORK.

AN ATLAS OF OPHTHALMOSCOPY, WITH AN INTRODUCTION TO THE USE OF THE OPHTHALMOSCOPE. By Dr. O. Haab, Professor of Ophthalmology, University of Zurich. Translated and edited by Ernest Clarke, M.D., B.S. (Lond.), Fellow of the Royal College of Surgeons; Surgeon to the Central London Ophthalmic Hospital; Ophthalmic Surgeon to the Miller Hospital.

F. A. DAVIS CO., PHILADELPHIA.

COLOR-VISION AND COLOR-BLINDNESS. A Manual for Railroad Surgeons. By J. Ellis Jennings, M.D. (University Pennsylvania), formerly Clinical Assistant, Royal London Ophthalmic Hospital (Moorfields); Lecturer on Ophthalmology and Chief of the Eye Clinic in the Beaumont Hospital Medical College; Ophthalmic and Aural Surgeon to the St. Louis Mullanphy and Methodist Deaconess Hospitals; Consulting Oculist to the Missouri, Kansas and Texas Railway System; Fellow of the British Laryngological and Rhinological Association; Secretary of the St. Louis Medical Society. With illustrations. 8vo. Pp. 110.

WEATHER BUREAU, WASHINGTON.

CLIMATE AND HEALTH. Edited under the direction of Professor Willis L. Moore, Chief of Weather Bureau, by W. T. R. Phillips, M.D. No. 3, a summary of statistics for the four weeks ended September 28, 1895.

ITEMS OF INTEREST.

MR. HENRY TAIT¹ has promised Luke Fildes's picture entitled "The Doctor" to the new Westminster Gallery, London, as soon as the building is finished. The painting will be open then to the world for inspection and discussion. Meanwhile, all who have seen the etching or lithographs of this painting will be interested in reading the following quotation from an article² published recently by the editor of the *Art Journal*.

Luke Fildes's Picture "The Doctor."

"After many studies, Mr. Fildes had the interior of a cottage erected inside his own studio. This was carefully planned and properly built, with rafters and walls and window, all as afterwards expressed in the finished picture. The composition has been recognized by the medical profession as a great and lasting compliment to the whole body. No more noble figure than the doctor could be imagined,—the grave anxiety supported by calm assurance in his own knowledge and skill, not put forward in any self-sufficient way, but with dignity and patience, following out the course his experience tells him is correct; the implicit faith of the parents, who, although deeply moved, stand in the background, trusting their doctor even while their hearts fail. At the cottage window the dawn begins to steal in, and with it the parents again take hope into their hearts, the mother hiding her face to escape giving vent to her emotion, the father laying his hand on the shoulder of his wife in encouragement of the first glimmerings of the joy which is to follow."

It would be interesting to know from what source the striking portrait of the doctor himself was obtained.

At the recent meeting of the Association of American Anatomists a committee composed of Drs. Mears, Bryant, and Dwight³ made an interesting report upon the subject of the preservation of anatomical material. The keeping of bodies by means of cold storage, a plant costing from five hundred to three thousand dollars, is believed to be the method which approaches most nearly to perfection. The bodies thus preserved should

On the Preparation of Anatomical Material.

¹ Review of Reviews, January, 1896.

² Art Annual, 1896.

³ Science, January 17, 1896.

be injected before being placed in the cold storage. It is suggested that in large cities where several institutions exist one plant would suffice. Of all the anatomical laws upon the statute books of the various States, that of Pennsylvania is considered to give the most satisfactory results. One novel method of keeping the subject is as follows: inject with carbolic acid, one and one-half pints; glycerin, six pints; and alcohol, one and one-half pints. After the injection has been made the subject should be painted daily for fourteen days with one part carbolic acid to six parts of glycerin. It is then to be placed in an air-tight box over a jar of methylated spirits. By this method there is said to be an absence of odor from the body and a characteristic appearance of the tissues. Wickersheim's formula consists of three thousand parts of pure water, one hundred and nine parts of alum, twenty-five parts of chloride of sodium, twelve parts of nitrate of potassium, sixty parts of carbonate of potassium, and ten parts of arsenious acid; to ten parts of a liquid so prepared one part of methylic alcohol and four parts of glycerin are added. Formalin may be used in the proportion of from one-half to one per cent., though the odor is disagreeable and the effect upon the skin of the hand is annoying.

A thorough overhauling of the affairs of the Jefferson Medical College has recently been made by the Trustees and Faculty. The chief changes are the establishment of a four years' graded course; the decision to remain in their former situation in the central portion of the city; the enlargement of the plant by the control of a large six-story building to the south of the college, for laboratory and clinical purposes; the salarizing of the Faculty; and the creation of the chair of Ophthalmology, to which Professor Thomson was elected, and of the chair of Pathology, to which Dr. George Dock, Professor of the Practice of Medicine in the University of Michigan, was called, but which he has declined. At the twenty-sixth annual meeting of the Alumni Association the Society pledged themselves to equip the Pathological Department by raising at least ten thousand dollars.

The William Pepper Clinical Laboratory was formally opened and presented to the University of Pennsylvania on Wednesday, December 4, 1895. The exercises were held in the amphitheatre of the University Hospital, and the occasion was notable for the presence of a large number of men prominent in the medical profession of this and other cities as well as of a number of distinguished members of the laity. The presentation was made by Dr. John S. Billings, who described the construction and the purpose of the building. Provost Harrison accepted the gift on behalf of the trustees. Dr. W. H. Welch, of Johns Hopkins University, made an address, giving an

Changes at Jefferson Medical College.

The William Pepper Clinical Laboratory.

account of the development of original scientific research on the problems presented by the human body and describing the evolution of clinical laboratories. The object of the laboratory is to provide an airy, commodious, and comfortable structure, in which it shall be possible to work out the various problems connected with the etiology, pathology, anatomy, and bacteriology of disease. Original work will be done by an efficient corps of associates in craniometry, chemistry, bacteriology, urinology, hæmology, and morphology. There will be no undergraduate teaching in the building. Dr. Pepper is the director, and he will devote a part of his personal time to working in its laboratories. The assistant director is Dr. Alfred Stengel.

The calendar of the Imperial University of Japan for 1894-95 shows that it ranks among the great universities of the world. All the schools are represented; there are laboratories, hospitals, and museums, an astronomical observatory, a seismological observatory, botanic gardens, a marine biological station, etc. The number of students is as follows:

University Hall.....	94
College of Law	432
College of Medicine.....	175
College of Engineering.....	229
College of Literature.....	179
College of Science.....	98
College of Agriculture.....	261
Total.....	1468

There are fourteen full professors in the college of science, and a majority of those registered in University Hall are engaged in scientific research. A large part of the work accomplished is published in the *Journal of the College of Science*, which maintains a high scientific standard.

Dr. J. Jameson,¹ of Transvaal fame, is a Scotchman, forty-three years of age, his medical studies having been pursued in the University College.

Entering this institution in 1870, he became a member of the Royal College of Surgeons in 1875, and graduated as an M.B. and B.S. in the University of London in the same year, receiving the degree of M.D. in 1877. As house-surgeon under the late Professor John Marshall, house-physician under Sir Russell Reynolds, and resident medical officer to the University College Hospital, his early medical training started off propitiously. As a young man Dr. Jameson gave evidence of the same personal magnetism which has so endeared

¹ British Medical Journal, January 11, 1896.

him to all sorts and conditions of men ; of generous instincts, though impulsive, there was nothing ignoble about him. Sir Cecil Rhodes, King Lobengula, and President Krüger have been patients of his, and all seem to be very grateful for the services rendered them during severe illnesses.

By the executive ability of Mrs. Willard, the Metropolitan Trained Nurses' Club,¹ situated at No. 104 West Forty-second Street, New York City, is an assured success. The club has recently been incorporated, and its membership is nearly one hundred. The nurse seeking employment, or desiring to rest after serving through a trying illness, is here able to obtain board and lodging for a sum within her means. It is Mrs. Willard's hope that in the near future a suitable building can be erected for the purpose, and that the club will always be composed of the best nurses that live in New York City. At the Home Bureau, 15 West Forty-second Street, besides being able to secure dainty dishes for the invalid, you may rent all articles necessary for use in a sick-room.

Examinations for license to practise medicine in the State of New York will be held on April 7 to 10, May 19 to 22, and June 16 to 19, 1896.

The examinations will be held in New York City, Albany, Syracuse, and Buffalo, and each candidate is notified as to the exact place.

On Tuesday mornings the examination will be in anatomy ; Tuesday afternoons in physiology and hygiene. On Wednesday mornings the examination will be in chemistry ; Wednesday afternoons in surgery. On Thursday mornings the examination will be in obstetrics ; on Thursday afternoons in pathology and diagnosis. On Friday mornings the examination will be in therapeutics. The morning hours are from 9.15 until 12.15, and the afternoon hours are from 1.15 until 4.15.

"Peter Burggraf's suit³ against Health Commissioner Z. Taylor Emery and Dr. Frank E. Boyden for five thousand dollars damages, based on the death of Mr. Burggraf's nine-year old daughter Julia, said to have resulted from vaccination, was continued yesterday before Judge Van Wyck and a jury in Part I. of the Supreme Court. Dr. Alvin H. Schwab, the family physician, said that 'the girl died from lock-jaw caused by the *infusion of dirt into the blood.*' A. H. Van Cott, the counsel for the Health Board, said that physicians

Newspaper Account of a Trial.

¹ Illustrated American, January 11, 1896.

² Buffalo Medical Journal, December, 1895.

³ New York Tribune, January 11, 1896.

knew that there was a disease germ *peculiar to* [prevalent in] Long Island which would produce lock-jaw if it was absorbed by the blood." It may be added that the jury disagreed.

The Medical Department of Vanderbilt University was reorganized last spring. A new faculty was elected and a graded course of three years was adopted. The faculty consists of ten professors and twenty instructors, lecturers, and assistants. Dr. William L. Dudley is dean of the faculty and Dr. Richard Douglas secretary. Dr. W. M. L. Coplin, late of Jefferson Medical College, Philadelphia, fills the chair of pathology and bacteriology. The department has removed, this session, into the Medical College building, lately erected and furnished at a cost of seventy thousand dollars.

The reported discovery of the bacillus of syphilis in the blood by Dr. van Niesser, of Wiesbaden,—not the one described by Lustgarten,—requires further confirmation before much attention should be paid to the announcement.

Among the many recent changes in the medical press, we note with special pleasure the revival of the *Index Medicus*, and the starting of a new scientific quarterly entitled the *Journal of Experimental Medicine*, which is to be edited by Professor W. H. Welch, of Baltimore, and published by D. Appleton & Co., of New York City.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for accepted articles after publication; or reprints, if stated on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 716 Filbert Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

MARCH, 1896.

[No. 2.]

ORIGINAL COMMUNICATIONS.

A CASE OF CONGENITAL ABSENCE OF BOTH RADII— CASE OF SYPHILITIC DISEASE OF THE SKULL AND BRAIN.

REPORT OF CASES OCCURRING IN THE SERVICE OF PROFESSOR JOHN ASHHURST, JR.,
HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

BY A. E. TAYLOR, M.D.

Congenital Absence of both Radii.—The subject was three years of age, the child of Poles in whose family existed no history of anomalies of any sort. In each forearm the radius was absent. The forearm was quite short, and markedly bowed, concavity outward. The muscles on the radial aspect were poorly developed. From the wrist-joint the hands were turned outward at an angle of about fifty degrees. The wrist-joint itself was very loose and freely movable, evidently an articulation of little strength, as the ligaments did not hold the ulna tightly to the carpal bones with which the ulna seemed directly to articulate. Pronation and supination were not performed, but the hand could be imperfectly rotated from the shoulder. Flexion and extension were normally free. The hands presented curious anomalies. Upon the left hand there was no thumb, only a tiny cutaneous excrescence, and the first metacarpal bone was likewise absent. Upon the right hand was a maldeveloped thumb, consisting of the two phalanges connected by a rudimentary articulation, the member connected to the hand by skin and fasciæ only, there being no trace of any metacarpo-phalangeal articulation nor of the thumb tendons. Being a useless member, this thumb was amputated. Coördination of the fingers was very imperfectly developed, and prehension was awkwardly performed.

Syphilitic Disease of the Skull and Brain ; Treatment by Trephining and the Administration of Large Doses of Iodide of Potassium ; Recovery.—The patient was a woman about thirty-five years of age. She gave a history of having suffered from a persistent eruption, and of several miscarriages. The symptoms for the relief of which she entered the hospital had continued for eight months. They consisted of constant excruciating headache and insomnia. The case had been diagnosed as an intracranial tumor. She described the headache as a boring pain, most severe upon the right side of the head and radiating into the forehead and eyes. There was slight internal strabismus. The general health was fairly good, the thoracic and abdominal viscera presented no evidences of disease. Upon the right side of the head, posterior to the line representing the location of the fissure of Rolando, occupying a position seemingly directly over the gyrus supramarginalis, was a large node, and directly above it and lying parallel to the line for the great longitudinal fissure was a ridge about two inches long. Both were slightly tender on pressure. These nodes were presumably of syphilitic origin, and the patient was placed upon ascending doses of potassium iodide, and morphine was administered to alleviate the pain and to procure sleep. The dose of iodide was rapidly increased until the daily dose was one and a half drachms. After ten days the condition of the patient was in no wise improved, rather worse. The headache was so severe that she was completely distracted, and relief was afforded only by very large doses of morphine.

The removal by trephining of the node, the pressure of which was evidently causing the pain, was suggested, and the proposition was accepted. The flap was made in the usual manner and the largest trephine applied to the site of the node. The bone was very dense and the progress of the instrument was very slow. The skull was three-quarters of an inch thick, and when the circle of bone was removed it was seen that the diploë was entirely obliterated (which was inferred from the absence of hemorrhage during the operation), and the greatly increased density and thickness were evidences of a long continued arteriosclerosis. The opening was enlarged with rongeur forceps. The dura mater was slightly sclerotic, the pulsation of the brain was normal. A Hey's saw was next applied to the above-mentioned ridge, and this was sawn through its entire length. The wound was then dressed, and the patient left the table in very good condition. The day following the operation she still had some headache, but after three or four days it disappeared. The iodide was resumed after the operation and the dose held at one and a half drachms daily. The wound healed promptly, and a fortnight after the operation the patient was discharged, with instructions to continue the iodide, which she has done for months. At the time of her discharge the slight strabismus still remained. After six months the patient has reported herself entirely well, and the strabismus has disappeared.

A CASE OF CONGENITAL DEFICIENCY OF THE FINGERS AND TOES.

BY CLARENCE KING, M.D.,

Machias, New York.

NOVEMBER 1, 1890, there was admitted to my care at the Cattaraugus County Hospital a patient with a congenital deficiency of the fingers of both hands and of the toes of both feet. Her history was as follows: Martha H., aged fifty-six, four feet ten inches in height, weight ninety-three pounds, never had any serious sickness; but five years before broke her leg and at the same time dislocated her ankle by dropping a heavy kettle on it. She stated that there had been no deformity or congenital defects among her relatives that she had ever heard of, but could not trace her ancestors back further than her grandparents. She had been told by her parents that her deformity was caused by mental impressions received by her mother when three or four months pregnant with her, and this explanation was received by her friends as a fact beyond dispute. At that time her mother had been left alone at a house some distance from any neighbors, when a tramp suddenly appeared in the doorway and demanded food, frightening her so badly that she fainted. She noticed that this man had no fingers upon his hands, and his singular appearance made such an impression upon her that it was several days before she could banish the thought of this man from her mind. Six months later, when her babe (our patient) was born, it showed the same defective formation of its hands, and in addition total absence of its toes, which defects at this time may be described as follows:

Right Hand.—Apparently only four metacarpal bones are present, one of them being for the thumb. The phalangeal bones of the thumb and the thumb-nail are absent. The first phalanx corresponding to each of the three metacarpal bones for the fingers is present, but there are only two nails, one being for the little finger; the other corresponds to the nails of two fingers united and measuring an inch and a quarter in breadth. These rudimentary digits are slightly flexed so that the palm presents a depression which will hold about half an ounce. The dorsal surface of the hand is covered with smooth skin, but the palmar surface shows deep creases which extend to the centre of the palm proper, thus marking out their rudimentary fingers.

Left Hand.—This hand presents five metacarpal bones, but is very like the right hand. The little finger is much more distinctly developed than on the right hand, and, like the right, has its own finger-nail. The thumb

has a terminal protuberance which is devoid of bony structure, and which lies directly in the palm of the hand beneath the tip of the little finger. The other fingers rest on top and all are united, showing palmar creases as in the right hand. The second nail on this hand is formed by the union of those for the other three fingers, and forms three-quarters of a circle and measures two inches from border to border. The palmar depression is deeper than that of the right hand and will hold over an ounce. (Fig. 1.)

Feet.—Each foot shows entire absence of all signs of toes except a shallow crease which marks where the border of the great toe should be. There are five distinct nails on each foot placed over distal ends of the metatarsal bones. There is also a bony peculiarity in the tarsal bones, the exact nature of which would require a dissection to determine. The patient walks with a marked “hitch” in her gait. (Fig. 2.)

In addition to these deformities, we note that her eyes are widely separated from each other and that the right eye protrudes abnormally and is opened wider habitually than the left. She also has a large nose which is very broad at the tip, but her face is in no other way deformed.

It is remarkable how much work this woman is able to do with her hands in such a crippled condition. She feeds herself, dresses and undresses herself, makes beds, and does all kinds of kitchen work. She can pick up small objects with her right hand, but cannot do so with her left. Of course, to do certain things, as for instance, to pour out tea or carry a lamp, she has to use both hands. Yet she has never had any serious accident from dropping things, except the one mentioned in the first paragraph of this paper.

A STUDY OF CHOLEDOCHOTOMY.

BY WILLIAM S. MAGILL, M.D., and MAURICE JOURDAN, M.D.,

of Paris.

of Marseilles.

THE first suggestion of incision of the common duct for the extraction of stone appears to come from Lagenbuch, who writes, in 1884, as follows: “In cases of persistent stenosis of the common duct, by incision of the canal, —most frequently enormously dilated, attaining the volume even of the small intestine,—collecting the bile with sponges, the stone could be extracted, and the incision of the common duct then closed with sutures.” In July, of 1885, Parkes, of Chicago, proposed the same intervention. Kümmel, in 1890, published the first operation of choledochotomy, performed six years before, in 1884. The same year Voigt mentions, in his monograph on the surgery of the liver ducts, an operation of choledochotomy done by Heussner. Thornton publishes three cases, operated by choledochotomy,

FIG. 1.

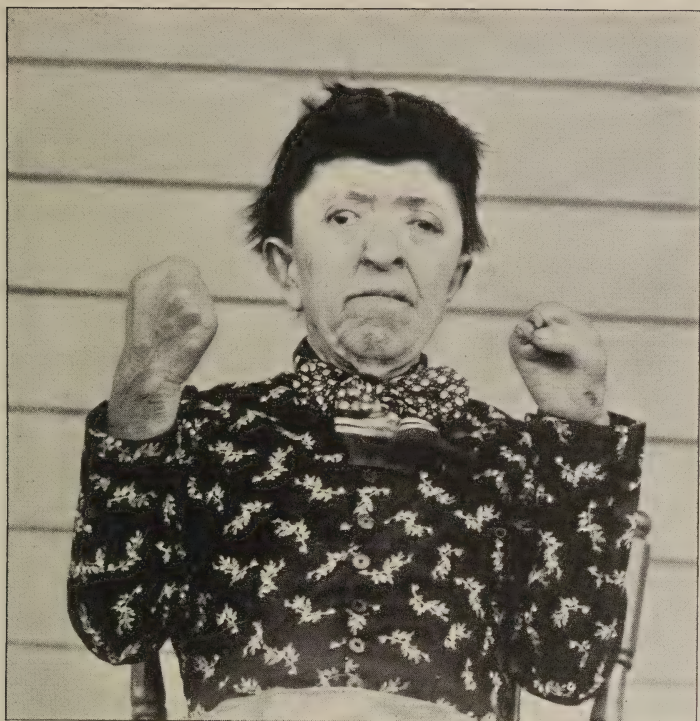


FIG. 2.



in 1889; and from this time isolated operations are found frequently in the medical publications. The report of Professor Terrier, read at the sixth session of the Congrès français de Chirurgie, included thirteen cases of choledochotomy, and introduced the subject to French surgeons. A little later he published, the first in France, a case of choledochotomy, reviewing at that time (1891) seventeen reports of the same operation.

Since the writing of this monograph we have not found other special studies of the subject than Martig's thesis "*Zur Chirurgie des Gallenwege*," Bâle, 1893, twenty-seven cases, and the contribution of Lepetit, which adds one more to the nineteen previously reported by Terrier. The Société de Chirurgie de Paris has recently discussed the subject, and in its bulletins will be found the important communications of Michaux, Quénu, Schwartz, and Tuffier. Seven cases of choledochotomy recently performed in France, one in Switzerland, and four in Germany, obligingly communicated to us for publication, added to our bibliographical research, give us a total of seventy-two interventions involving the incision of the common duct.

These seventy-two histories, serving as the basis of our study and the authority of our own conclusions, may best be given here in a chronological table.

A reference to the table on the next page will show the necessity of considering the operation of choledochotomy in various groups of cases.

The total contraction of the gall-bladder so that it is unrecognizable even in the mass of adhesions formed with the under surface of the liver, or the absence of calculi in the bladder, assured by palpation, determines a class of cases in which the only intervention consists in establishing the permeability of the common duct; the operation becomes one of simple choledochotomy.

Sometimes, however, after operating on the common duct, the gall-bladder is opened to remove the stones therein contained, or to verify their absence, and then the open bladder may be excised, definitively closed, and reduced into the abdomen or stitched in the parietal wound. The entire intervention thus becomes a choledochotomy, with cholecystectomy, cholecystotomy, or cholecystostomy, according to the treatment of the open gall-bladder.

Again, choledochotomy may be resorted to as a second intervention, the anterior operation not having relieved the stenosis of the common duct. The usual example of this is found in the creation of a biliary fistula to put an end to the accidents of retention of the gall, caused by a calculous obstruction of the common duct, in which case choledochotomy is subsequently necessary in order to cure the fistula.

The varying conditions and complications of the intervention itself, variable for the different kinds of calculous obstruction, are of great importance in the consideration of results. The distinction is imperative between a primitive choledochotomy and that secondary to a biliary fistula,

No. of Statistical Tables.	Surgeon.	Date of Operation.	Nature of the Intervention.	Recovered.	Died.
26	Kümmel.	Feb. 6, 1884.	Choledochotomy and cholecystectomy.		1
1	Thornton.	May 9, 1889.	Choledochotomy.	1	
46	Thornton.	June 2, 1889.	Choledochotomy and cholecystostomy.	1	
35	Heussner.	June 6, 1889.	Choledochotomy and ideal cholecystostomy.	1	
2	Thornton.	Nov. 28, 1889.	Choledochotomy.	1	
3	Courvoisier.	Jan. 21, 1890.	Choledochotomy.	1	
36	Lloyd.	Jan. 24, 1890.	Choledochotomy and cholecystostomy.		1
37	Courvoisier.	Feb. 18, 1890.	Choledochotomy and ideal cholecystostomy.	1	
69	Courvoisier.	March 23, 1890.	Choledochotomy and cholecystenterostomy secondary to cholecystostomy and choledocholithotripsy.	1	
4	Küster.	June 11, 1890.	Choledochotomy.	1	
56	Hochenegg.	Dec. 21, 1890.	Choledochotomy and cysticotomy.	1	
57	Kehr.	Dec. 28, 1890.	Choledochotomy secondary to cholecystostomy.	1	
5	Van der Veer.	Jan. 15, 1891.	Choledochotomy.		1
27	Rehr.	March 10, 1891.	Choledochotomy and cholecystectomy.	1	
28	Abbe.	April 13, 1891.	Choledochotomy; cholecystectomy.	1	
6	Braun.	April, (?) 1891.	Choledochotomy.	1	
7	Frank.	May 27, 1891.	Choledochotomy.	1	
58	Riedel.	May 28, 1891.	Choledochotomy secondary to cholecystostomy.	1	
29	Roux.	June 16, 1891.	Choledochotomy and cholecystectomy.	1	
8	Jaboulay.	June, (?) 1891.	Choledochotomy.		1
47	Riedel.	July 18, 1891.	Choledochotomy and cholecystostomy.	1	
59	Kehr.	July 28, 1891.	Choledochotomy secondary to cholecystostomy.	1	
43	Küster.	July 30, 1891.	Choledochotomy and ideal cholecystostomy.	1	
48	Sutton.	Sept. 18, 1891.	Choledochotomy and cholecystostomy.	1	
49	Riedel.	Oct. 2, 1891.	Choledochotomy and cholecystostomy.	1	
9	Riedel.	Oct. 15, 1891.	Choledochotomy.	1	
50	Riedel.	Dec. 12, 1891.	Choledochotomy and cholecystostomy.		1
60	Kehr.	April 18, 1892.	Choledochotomy secondary to cholecystostomy.	1	
10	Terrier.	April 19, 1892.	Choledochotomy.		1
51	Lauenstein.	June 2, 1892.	Choledochotomy.	1	
30	Studsgaard.	June 3, 1892.	Choledochotomy and cholecystectomy.	1	
11	Socin.	July 9, 1892.	Choledochotomy.	1	
31	Kehr.	Oct. 12, 1892.	Choledochotomy and cholecystectomy.	1	
12	Duncan.	Oct., (?) 1892.	Choledochotomy.	1	
14	Lane.	Dec. 8, 1892.	Choledochotomy.		1
13	Doyen.	(?) 1892.	Choledochotomy and choledochorrhaphy.	1	
15	Kehr.	Jan. 19, 1893.	Choledochotomy.	1	
67	Robson.	Jan. 28, 1893.	Choledochotomy secondary to cystico-colostomy.		1
70	Kehr.	Feb. 4, 1893.	Choledochotomy secondary to choledochotomy and cholecystectomy.	1	
44	Anderson.	Feb. 25, 1893.	Choledochotomy and ideal cholecystostomy.	1	
16	Billroth.	Feb., (?) 1893.	Choledochotomy (choledochostomy).		1
17	Lauenstein.	March 16, 1893.	Choledochotomy.	1	
61	Kehr.	April 27, 1893.	Choledochotomy secondary to cholecystostomy.	1	
18	Jaboulay.	April, (?) 1893.	Choledochotomy.		1
52	Körte.	April, (?) 1893.	Choledochotomy and cholecystostomy.	1	
62	Elliot.	May 22, 1893.	Choledochotomy secondary to cholecystostomy.	1	
45	Czerny.	July 11, 1893.	Choledochotomy and cholecystostomy.		1
53	Lauenstein.	July 30, 1893.	Choledochotomy and cholecystostomy.	1	
38	Czerny.	August 1, 1893.	Choledochotomy and ideal cholecystostomy.	1	
39	Jaboulay.	August 20, 1893.	Choledochotomy and cholecystostomy.	1	
63	Kehr.	Sept. 16, 1893.	Choledochotomy secondary to cholecystostomy.	1	
19	Murphy.	Sept. 23, 1893.	Choledochotomy.		1
54	Lauenstein.	Nov. 11, 1893.	Choledochotomy and cholecystostomy.		1
65	Kümmel.	Dec. 5, 1893.	Choledochotomy secondary to cholecystostomy.	1	
71	Lane.	Dec. 21, 1893.	Choledochotomy by two interventions.	1	
66	Terrier.	Jan. 11, 1894.	Choledochotomy secondary to cholecystectomy.	1	
40	Czerny.	Jan. 16, 1894.	Choledochotomy and ideal cholecystostomy.	1	
20	Quénu.	Feb. 14, 1894.	Choledochotomy.		1
64	Kehr.	Feb. 20, 1894.	Choledochotomy secondary to cholecystostomy and cysticotomy.	1	
55	Kehr.	Feb. 26, 1894.	Choledochotomy and cholecystostomy and cysticotomy.	1	
58	Thiriar.	March 2, 1894.	Choledochotomy secondary to choledocholithotripsy.	1	
41	Czerny.	May 4, 1894.	Choledochotomy and ideal cholecystostomy.	1	
21	Pozzi.	May 25, 1894.	Choledochoduodenotomy.	1	
22	Jaboulay.	August 19, 1894.	Choledochotomy.	1	
42	Czerny.	Sept. 7, 1894.	Choledochotomy, cysticotomy, and ideal cholecystostomy.	1	
32	Michaux.	Sept. 14, 1894.	Choledochotomy and cholecystectomy.		1
72	Quénu.	Nov. 19, 1894.	Choledochotomy by two interventions.	1	
33	Michaux.	Nov. 23, 1894.	Choledochotomy and cholecystectomy.	1	
23	Lane.	Dec. 9, 1894.	Choledochotomy.		1
24	Duplay.	Feb. 7, 1895.	Choledochotomy.		1
25	Terrier.	March 19, 1895.	Choledochotomy.	1	
34	Schwartz.	May 8, 1895.	Choledochotomy and cholecystectomy.		1

the existence of which has done away with the phenomena of biliary retention,—the accidents of infection of the bile-ducts,—and has already secured for the patient a much better general condition. A secondary choledochotomy allows the removal of the obstructing calculi, re-establishes the normal flow of the bile, and invites the fistula to close from disuse, after having served temporarily as a safeguard against the accumulation or tension of the gall. Under such conditions the choledochotomy cannot be compared with the same operation on a patient intensely jaundiced and weakened from the long biliary retention, with febrile symptoms and infected liver-ducts. Three groups would include seventy of the cases we propose to study. But there remain two in which the operation of choledochotomy was performed by two separate interventions. The interest of these two cases allows their classification for study in a fourth group.

We will then consider our subject as follows:

GROUP I.—Choledochotomy—simple—twenty-five cases, table Nos. 1-25.

GROUP II.—Choledochotomy associated with interventions on—

A. The gall-bladder or bladder and cystic duct at the same time.

1. Cholecystectomy, nine cases, Nos. 26-34.
2. Cholecystotomy, eleven cases, Nos. 35-45.
3. Cholecystostomy, ten cases, Nos. 46-55.

B. The cystic duct only, cysticotomy, one case, No. 56.

GROUP III.—Choledochotomy, secondary to another operation on—

A. The gall-bladder or the cystic duct.

1. Cholecystostomy, eight cases, Nos. 57-64.
2. Cholecystotomy, one case, No. 65.
3. Cholecystectomy, one case, No. 66.
4. Cystico-enterostomy, one case, No. 67.

B. The common duct.

1. Choledocholithotripsy, one case, No. 68.

C. The gall-bladder and the common duct.

1. Cholecystostomy and choledocholithotripsy, one case, No. 69.
2. Cholecystectomy and incomplete choledochotomy, one case, No. 70.

GROUP IV.—Choledochotomy by two interventions, two cases, Nos. 71 and 72.

GROUP I.—CHOLEDOCHOTOMY—SIMPLE.

Of the twenty-five interventions of this group, notes of six cases communicated to us for publication will be found at the end of the paragraph. In all of the twenty-five the lithiasis, strictly limited to the common duct, restricted the intervention to that of simple choledochotomy. Five times the gall-bladder could not be found, thirteen times it was extremely difficult to recognize or was contracted to the

last degree. Twice the gall-bladder is noted as of normal dimensions, and five times it is not even mentioned, which would allow the supposition that it was not found or was empty. Twenty-five operations gave twelve fatal results, a mortality far beyond that of the other groups of choledochotomy. But the explanation is easily given, for in this group are found the cases operated upon *in extremis* or under unusually bad conditions; witness the two cases of Jaboulay here published, and that of Lane.

A woman suffering from jaundice of four years' duration was brought to the hospital in a very bad condition. During the two days that passed prior to operation a constant delirium and extreme prostration existed. The intervention at so late a period did not affect the delirious conditions, which soon terminated in death.

CHOLEDOCHOTOMY, SIMPLE. (25 Cases.)

No. 1. Surgeon: THORNTON. **Sex and Age:** Female, thirty-six years. **Clinical History:** Jaundice and hepatic colics for a long time; loss of flesh. **Actual Condition:** Chronic jaundice very manifest; fever. **Operation Notes:** May 9, 1889. Gall-bladder so contracted that it can scarcely be recognized; common duct contains two stones, one above the other, which are successively removed; the neighboring viscera confounded in a mass of adhesions; after extraction of the stones, the wall of the common duct is sutured, a drain introduced as far as the suture-line, and a glass tube is placed in the pouch of Douglas and brought out by an opening made in the abdominal wall just above the pubis. **Result:** Recovery rapid; several days after the operation the gall flowed from the drain. In February, 1891, the patient was visited, and her perfect recovery is noted.

No. 2. Surgeon: THORNTON. **Sex and Age:** Female, forty-three years. **Clinical History:** Nine months before the first hepatic colics appeared and lasted fifteen days, to reappear from time to time since, and accompanied with jaundice; loss of flesh. **Actual Condition:** Deep jaundice; the volume of the liver increased; an ill-defined tumor felt in the region of the gall-bladder. **Operation Notes:** November 28, 1889. The liver so large that it entirely covers the gall-bladder and ducts; numerous adhesions; isolation of the bladder impossible; cystic duct atrophied; stone in the common duct; its removal difficult on account of the size of the liver, necessitating an operation deep down in the abdomen, guiding the knife with the left forefinger; the incision of the common duct gives rise to a considerable hemorrhage traced to a vein of the omentum included in the surrounding adhesions; calculus attached to the wall is removed only after some difficulty; six fine silk stitches close the common duct, and over this line of suture the torn omentum is stitched with a running thread; a glass drain is introduced in the subhepatic region. **Result:** Recovery; postoperative shock; the first urine contained large quantity of albumin; the fifth day the urine less colored by biliary pigments; drain removed the sixth day; colored stools the eighth day; wound completely closed the fifteenth day. Nine weeks after the operation the patient was enjoying good health; the jaundice had not yet entirely disappeared.

No. 3. Surgeon: COURVOISIER. **Sex and Age:** Female, forty-six years. **Clinical History:** An attempt at choledocholithotripsy, interrupted by the collapse of the patient, left the woman, on leaving the hospital, in September, 1889, in no way better; violent hepatic colics, chills and fever, persistent jaundice, and very bad general condition determine another entrance to the hospital. **Actual Condition:** Chronic jaundice; fever. **Operation Notes:** January 21, 1890. Numerous adhesions causing great difficulty to find a stone in the common duct; the calculus, the size of a nutmeg, situated deep down beneath the liver between that organ and the duodenum; incision of the wall of the common duct for a length of one centimetre and a half; the stone adheres to its lodge, but is finally extracted with the aid of a lever; a catheter is passed up and down the common duct, a small branch of the hepatic artery is ligated, and three silk stitches close the incision of the common duct; drain placed on the suture-line. **Result:** Recovery;

stools deeply colored the seventh day; rapid disappearance of the jaundice; wound completely healed the twentieth day, never having shown any flow of gall.

No. 4. Surgeon: KÜSTER. Sex and Age: Female, forty-nine years. **Clinical History:** Hepatic colics for the last two years, becoming more and more frequent, and lately reappearing every week, with fever and jaundice, which disappears slightly but never completely during the intervals of the attacks; loss of weight, from one hundred and forty pounds to eighty-eight pounds, the actual weight. **Actual Condition:** Chronic jaundice; the volume of the liver increased; the gall-bladder perhaps to be felt. **Operation Notes:** June 11, 1890. Transverse incision near and parallel to the costal border; the colon adheres to the liver and to the gall-bladder; this latter is not dilated and contains no stone; in the dilated common duct two calculi are found; incision two centimetres in length, each edge held up with a thread loop; extraction of two large stones and several small ones; suture of the incision; first plane with catgut stitches, second plane with a running thread of fine silk; packing with iodoform gauze. **Result:** Recovery; a flow of mixed gall and blood from the wound; jaundice increases; stools uncolored; the fifth day the removal of the packing allows a hemorrhage, reproduced the eleventh day, and only stopped by cauterizing; jaundice disappears, the stools become colored, and June 30 the wound had healed completely. Reappearance of attacks of pain in November, 1890, reoccurring from time to time until August, 1891, when a cure at Carlsbad caused the elimination of two calculi, the disappearance of all pain, and complete cure.

No. 5. Surgeon: VAN DER VEER. Sex and Age: Male, fifty-one years. **Clinical History:** Hepatic colic for two years; jaundice at first temporary, but for the last year persistent; symptoms of hepatic insufficiency. **Actual Condition:** Chronic jaundice; liver small; gall-bladder imperceptible. **Operation Notes:** January 15, 1891. Vertical lateral incision; atrophied gall-bladder; adhesions; large stone (maximum diameter, five centimetres; minimum, two and a half centimetres) in the common duct; attempt to push it into the duodenum fails; incision of the common duct; extraction of the calculus; catheterization of the canal; suture of its walls with some difficulty; two rows of stitches; glass drain and iodoform packing. **Result:** *Death* the ninth day; *no post-mortem nor details.*

No. 6. Surgeon: BRAUN. Sex and Age: Female, forty years. **Clinical History:** Violent hepatic colics and persistent jaundice for the last eight months. **Actual Condition:** Chronic jaundice; the dilatation of the gall-bladder cannot be determined. **Operation Notes:** April, 1891. Curved incision parallel to the costal border; large stone in the common duct near to the duodenum, drawing up the duct which is held by an assistant; the wall is incised and the stone extracted (diameter, one centimetre); catheterization of the canal; the incision of which is closed with four stitches; drainage with iodoform gauze. **Result:** Recovery; the first stool was colored.

No. 7. Surgeon: FRANK. Sex and Age: Female, forty-two years. **Clinical History:** Violent hepatic colics for the last two months with jaundice; seven calculi have been eliminated with the stools; attacks very frequently repeated and followed by temporary jaundice. **Actual Condition:** Jaundice; liver not increased in volume; gall-bladder not perceptible. **Operation Notes:** May 27, 1891. First incision along the right costal border; second incision from the middle of the first to the navel; adhesions of the colon and stomach to the liver; gall-bladder greatly contracted, no larger than a hazel-nut, and hardened; a stone, as large as the end of the thumb, is felt in the common duct near its opening into the duodenum; after incising the calculus is removed with the aid of forceps; considerable hemorrhage; two rows of sutures; drainage with iodoform gauze. **Result:** Recovery; no flow of bile from the wound, which was completely cicatrized the fifteenth day. Visited five months later, the complete cure was noted.

No. 8. Surgeon: JABOULAY. Sex and Age: Male, thirty-one years. **Clinical History:** Biliary lithiasis of long date; recently the jaundice had become more severe; a continued fever of 105° to 105.8° F.; transferred from medical to surgical ward for emergency operation. **Actual Condition:** Chronic jaundice; liver greatly increased in volume; continued high fever. **Operation Notes:** June, 1891. Operation *in extremis*;

incision on the middle line; gall-bladder empty, contracted, and adherent; in the supra-duodenal portion of the common duct a stone as large as a marble is found; incision upon the calculus, which can be removed only after its crushing, the pieces then scraped out with a curette; abscess on the inferior surface of the liver; iodoform packing. **Result:** *Death* the following evening, the acute accidents not having ceased; the temperature had fallen gradually to 100° F., but the coma had never disappeared; *post-mortem* showed angiocholitis, periangiocholitis having suppurated, and intrahepatic abscesses.

No. 9. Surgeon: RIEDEL. Sex and Age: Female, fifty years. **Clinical History:** Twenty-five years ago first suffered with hepatic colic, but for the last six months the attacks have been most violent; jaundice and continued pain; from one hundred and sixty-two pounds her weight has diminished to one hundred and thirty pounds. **Actual Condition:** Jaundice; liver of increased volume; gall-bladder not perceptible. **Operation Notes:** October 15, 1891. Vertical lateral incision; adhesions of the omentum to the liver and parietal peritoneum; gall-bladder atrophied to the size of an English walnut; adherent to the stomach and the transverse colon; empty; the cystic duct atrophied; in the common duct, which is greatly dilated, is found a stone which is extracted after incision; catheterization of the duct with the aid of the finger; suture of the incision with silk; no drainage. **Result:** Recovery; wound healed the tenth day; jaundice disappeared. Visited in January, 1892, the patient was in good health and had gained twelve pounds in weight.

No. 10. Surgeon: TERRIER. Sex and Age: Male, thirty-two years. **Clinical History:** Eight years ago first attack of hepatic colic, but without jaundice; six years ago five or six slight attacks without jaundice; four years ago three attacks; and two years ago five or six. In July, 1891, he had a most violent attack lasting six days, with fever, but no jaundice until the next month, when it came on without pain, and has since persisted; constant pain in the right hypochondrium; loss of flesh. **Actual Condition:** Chronic jaundice; liver increased in volume; at the region supposed to be occupied by the gall-bladder an ill-defined tumefaction can be felt. **Operation Notes:** April 19, 1892. Vertical lateral incision; the hypertrophy of one of the lobes of the liver was found to be the tumefaction attributed to the gall-bladder before the operation; adhesion of the transverse colon to the liver; gall-bladder cannot be found; near the hilus of the liver are found some lymphatic ganglia and a hard cord is there felt descending to the head of the pancreas, the dissection of which is difficult; in the head of this organ a calculus is distinctly felt, lying in the common duct near its termination in the ampulla of Vater; efforts to crush it or push it into the duodenum were unavailing; placing the fingers of the left hand behind and a little above the head of the pancreas an incision was made directly upon the stone, which removed showed an ovoid form with rough surface one and a half centimetres long and one centimetre wide; the duct was assured free from other obstruction by passing a No. 6 catheter in both directions; suture with four silk stitches, which included a part of the pancreas which continued to bleed a little; drain placed in the subhepatic region. **Result:** *Death* April 21, at 1 A.M. April 19, 5 P.M., the temperature = 98° F., pulse 95; April 20, A.M., temperature = 98° F., pulse 120; a slight flow of serous matter, colored yellow; P.M., temperature = 101.3° F., pulse 180. *Post mortem:* no trace of peritonitis; no liquid in the abdomen; the incision of the common duct was well closed by the sutures; gall-bladder scarcely contained a trace of bile, and had almost disappeared in the mass of contractile tissue, only as large as a hazel-nut. Histological examination of liver showed the atrophy of the hepatic cells, sclerosis of the intracellular tissue as well as that of the bile-ducts.

No. 11. Surgeon: SOGIN. Sex and Age: Female, thirty-five years. **Clinical History:** Five months ago, after an attack of hepatic colic, she was taken with jaundice, which has since persisted. **Actual Condition:** chronic jaundice; liver slightly increased in volume; an induration is felt to the right of the navel (adhesions?). **Operation Notes:** July 9, 1892. Transverse incision, twelve centimetres in length, commencing at the navel; gall-bladder very small; stone, the size of a prune, in the common duct, the wall of which is incised for a length of two and a half centimetres, the edges of this incision maintained with thread loops: the calculus is extracted in fragments; two rows

of stitches close the incision; the abdominal wound then sutured. **Result:** Recovery; the evening of the day following the operation symptoms of internal hemorrhage appeared; collapse; reopening the abdomen a large quantity of coagulated blood was removed, but the source of the bleeding not found; iodoform-gauze packing; complete recovery September 8. Revisited in June, 1895, the recovery is noted to be complete.

No. 12. Surgeon: DUNCAN. **Sex and Age:** Female, fifty-three years. **Clinical History:** Hepatic colic for the last twelve years, becoming more frequent, with fever and jaundice, with tendency to persist, with slight variations of intensity. **Actual Condition:** Chronic jaundice; gall-bladder not felt; fever. **Operation Notes:** October, 1892. Gall-bladder atrophied, containing no stones; in the supraduodenal portion of the common duct a calculus is found; adhering to this region is the hepatic flexure of the colon; incision of the duct and removal of a stone weighing seven grammes; the incision is left unsutured; a glass tube introduced into the common duct serves for drainage, with a second glass tube introduced by the abdominal wound. **Result:** Recovery; a colored stool on the third day; drain removed the fourth day; biliary fistula closes spontaneously at the end of three weeks.

No. 13. Surgeon: DOYEN. **Sex and Age:** Female, forty-nine years. **Clinical History:** At first a temporary jaundice which becomes permanent after several months; a bad general condition. **Actual Condition:** Chronic jaundice; the volume of the liver a little less than the normal; gall-bladder not felt; deep down behind the cartilage of the ninth rib a small tumor, the size of a horse-chestnut, can be distinguished. **Operation Notes:** 1892. Vertical lateral incision increased by a transverse section along the costal border; no trace of the gall-bladder; large stone in the first portion of the common duct, which is incised and thus allows the extraction of a calculus weighing fourteen grammes; the adhesion of the walls of the duct caused them to be torn by the extraction of the stone; catheterization; drain introduced into this duct and another into hepatic; overhand stitch to unite the torn edges and close the incision of the common duct, and over this is stitched the peritoneal and connective tissue, a running thread being used; a few superficial suture-points are then placed to assure the union of all. **Result:** *Death* the eighth day. *Post mortem:* No accumulation of bile in the peritoneal cavity; an advanced condition of biliary cirrhosis.

No. 14. Surgeon: LANE. **Sex and Age:** Female (?). **Clinical History:** Hepatic colics with jaundice for several years. **Actual Condition:** Febrile symptoms; signs of stenosis of the common duct. **Operation Notes:** December 8, 1892. Stone in the common duct, which is incised, the calculus extracted, and incision then carefully sutured; glass drain introduced into the subhepatic region; no packing employed. **Result:** *Death* the third or fourth day, probably the result of peritonitis.

No. 15. Surgeon: KEHR. **Sex and Age:** Female, forty years. **Clinical History:** Hepatic colic for the last ten years, for the last four of which the jaundice has persisted. **Actual Condition:** Chronic jaundice; liver of increased volume; gall-bladder imperceptible. **Operation Notes:** January 19, 1893. Vertical lateral incision; numerous adhesions between the liver and the transverse colon and between the latter and the gall-bladder, which is small and contracted; the dissection of the adhesions tears the serous coat of the colon slightly, which tear is repaired with two stitches; three large stones are found in the common duct between the liver and the duodenum; incision of the canal and removal of the calculi, followed by the suture of the wound; rubber drain placed on the suture line. **Result:** *Death* eighty hours after the operation; peritonitis caused by the perforation of the colon at the point where the serous coat had been injured; the suture of the common duct was in good condition.

No. 16. Surgeon: BILLROTH. **Sex and Age:** Female, fifty years. **Clinical History:** Violent attacks of hepatic colic with pronounced jaundice. **Actual Condition:** Chronic jaundice; a hard mass is felt in the region of the gall-bladder (adhesions). **Operation Notes:** February, 1893. Choledocotomy or choledocostomy; the region of the gall-bladder is occupied by a thick mass of adhesions, behind which is found a dilated pocket, assumed to be the gall-bladder; this is incised, and from it is extracted in fragments a large calculus, and another stone lower down disappears on palpation; the

edges of this pocket are brought to the abdominal wound and the whole dressed. **Result:** *Death* the seventh day; a large quantity of liquid of brownish color flowed from the wound; bloody stools; *post-mortem* showed that the pocket was the dilated common duct; the gall-bladder was entirely atrophied.

No. 17. Surgeon: LAUENSTEIN. Sex and Age: Female, thirty-five years. **Clinical History:** Hepatic colic for five years; persistent jaundice for the last three months. **Actual Condition:** Chronic jaundice; liver of increased volume; gall-bladder not perceptible. **Operation Notes:** March 16, 1893. Vertical lateral incision; gall-bladder atrophied and adhering to the omentum, but contains no stones; near to the duodenum, in the common duct, is a large calculus; incision between two thread loops; considerable hemorrhage; extraction of the stone; seven stitches with catgut close the incision; iodoform packing. **Result:** Recovery; a colored stool on the fifth day; the flow of gall from the wound ceases the sixth day, and the fistula is closed entirely the fifteenth day.

No. 18. Surgeon: JABOULAY. Sex and Age: Male, thirty years. **Clinical History:** Biliary lithiasis for a long time; intense jaundice and continued fever. **Operation Notes:** April, 1893. Emergency operation, the patient *in extremis*; this case closely similar to No. 8 of this table; three calculi removed from the common duct. **Result:** *Death*; suppurative angiocholitis.

No. 19. Surgeon: MURPHY. Sex and Age: Female, thirty-five years. **Clinical History:** Biliary lithiasis for three years; hepatic colic twice without jaundice; for the last five weeks jaundice, persisting pain, and fever. **Actual Condition:** Intense jaundice; gall-bladder not perceptible; fever = 103° F. **Operation Notes:** October 23, 1893. Atrophied gall-bladder; a large stone in the middle portion of the common duct, which is incised; slight hemorrhage; extraction of the calculus; suture of the incision with a running thread; drainage with iodoform gauze. **Result:** *Death* the third day; no *post-mortem*; probably a peritoneal infection.

No. 20. Surgeon: QUÉNU. Sex and Age: Female, forty-one years. **Clinical History:** Jaundice having persisted for four months; no pain and no hepatic colic. **Actual Condition:** Liver of increased volume; gall-bladder not perceptible. **Operation Notes:** February 14, 1894. Median incision; gall-bladder atrophied, its fundus two or three centimetres behind the edge of the liver; stone as large as an olive in the supraduodenal portion of the common duct; a hand passed beneath the pedicle of the liver raises it up and fixes the calculus incision, the edges of which are held up with forceps; extraction of the stone and suture with five fine silk stitches, and a second row of stitches repairing the torn gastro-hepatic omentum; isolation of field of operation and drainage as far as the common duct. **Result:** *Death* the third day; first day vomit of bloody matter; second day, small quantity of blood in the dressing; jaundice increases; *post-mortem* shows obliteration of bile-ducts by coagulated blood.

No. 21. Surgeon: POZZI. Sex and Age: Female, thirty-seven years. **Clinical History:** Jaundice constantly increasing for the last three years; hepatic colic for the same length of time, very frequent, but less so recently; continued dull pain in the right hypochondrium; incomplete stenosis of the common duct; stools are colored; general condition very bad; chills and fever; epistaxis and metrorrhagia. **Actual Condition:** Chronic jaundice; liver of greatly increased size; gall-bladder not perceptible. **Operation Notes:** May 25, 1894. Choledochoduodenotomy; median incision with transverse incision of half of the right rectus; intestine adheres to liver; gall-bladder contracted and shrivelled, very difficult to recognize; in the midst of a mass of adhesions a tumor as large as an English walnut, appearing to occupy the place of the pylorus, but a scratch of this tumor lets out bile, a catheter, introduced by this orifice, feels a stone as large as an almond, removed by incision of the wall; the calculus lay partly in the common duct and partly in the duodenum (its first portion); suture of the incision with three rows of stitches with silk thread; drainage and iodoform packing. **Result:** Recovery; during the first five days pulmonary congestion and insufficiency of the hepatic functions; drain removed the fifth day; no flow of bile; at the end of July the jaundice had almost

entirely disappeared; liver had diminished in size. Seen in May, 1895, the complete recovery of the patient is noted.

No. 22. Surgeon: JABOULAY. Sex and Age: Female, fifty years. **Clinical History:** Violent hepatic colic for five years, becoming more frequent; patient has been confined to her bed for two years; intense jaundice; attacks of fever. **Actual Condition:** Chronic jaundice; fever. **Operation Notes:** August 19, 1894. Median incision; gall-bladder of average size; two stones in the common duct; incision and extraction; incision closed with two points of catgut; iodoform packing. **Result:** Recovery; packing removed the tenth day; one month later the biliary fistula was completely closed. Visited April 17, 1895, complete recovery is noted, and a gain in weight of twenty-five pounds.

No. 23. Surgeon: LANE. Sex and Age: Female (?). **Clinical History:** Jaundiced for four years; general condition bad; on entrance to the hospital delirium and prostration. **Operation Notes:** February 25, 1895. Emergency operation in *extremis*; colon adheres to the gall-bladder; removal of several stones from the common duct after its incision; drainage by a rubber tube introduced into the canal; iodoform packing. **Result:** *Death* without any relaxation of the delirium nor change in the bad condition noted before operation.

No. 24. Surgeon: DUPLAY. Sex and Age: Female, thirty-six years. **Clinical History:** Hepatic colic three years ago, accompanied by fever and jaundice which lasted six weeks; in January, 1894, jaundice reappeared, without any pain, and has now lasted thirteen months; for the last six months the hepatic colic has reappeared and become more and more frequent. **Actual Condition:** Chronic jaundice; liver not increased in size; gall-bladder not perceptible. **Operation Notes:** February 7, 1895. Median incision supplemented by a transverse; transverse colon adheres to the liver; no trace of the gall-bladder can be found; a stone is felt in the dilated common duct a few centimetres beneath the liver and extracted by incision of the wall; considerable hemorrhage of venous origin; three silk threads close the incision; iodoform packing. **Result:** *Death* the third day; no gall had flowed into the packing; *post mortem*: no trace of peritonitis; the sutures had held well; signs of insufficiency of the hepatic function.

No. 25. Surgeon: TERRIER. Sex and Age: Female, fifty-eight years. **Clinical History:** Twenty years ago, dull pain in the right hypochondrium with crises of acute pain from time to time during eight months, but no jaundice; five years ago hepatic colic during one month; no jaundice; eighteen months ago more crises with jaundice, which still persists with dull pain in the right hypochondrium; fever from time to time; loss in weight from one hundred and sixty-six to one hundred and seventeen pounds. **Actual Condition:** Chronic jaundice; liver of increased size; gall-bladder not perceptible; spleen hypertrophied. **Operation Notes:** March 19, 1895. Vertical lateral incision; omentum adheres somewhat to the liver; gall-bladder cannot be found; movable stone in the supraduodenal portion of the common duct the size of a pea; incision; considerable hemorrhage of venous origin; two forceps stop the bleeding; compression for a few minutes; after removing the compression the calculus is felt, but immediately escaped from beneath the finger, passing up the hepatic duct, where every effort failed to find it; packing with sterilized compress and gauze. **Result:** Recovery; no temperature above the normal; the first stool on the fourth day was slightly colored and normally so after the eighth day; removal of drain the tenth day; fistula completely closed the twenty-fifth day; jaundice disappeared; pneumonia April 20. Visited May 25, it is noted that this fistula reopened and bled slightly, but let out no bile; no jaundice; stools normally colored; this patient died during the month of June, not able to recover from the effects of pneumonia.

Such cases can have no bearing on the question of the value of the operation, and only serve as a warning of the inevitable result of postponing too long the surgical aid required. Of the nine fatal cases remaining, three are certainly to be attributed to peritonitis. For the first, Kehr,

Case XV., we read in the description of the operation that during the liberation of the gall-bladder, which adhered strongly to the transverse colon, a portion of the serous coat of the bowel was torn, repaired with two sutures, but their inefficacy was shown later by the perforation of the colon and the issue of intestinal matter into the peritoneal cavity, causing acute peritonitis. In the second, Lane, Case XIV., the cause of the peritonitis is attributed by the surgeon to the insufficient drainage procured by the glass tube inserted without gauze to protect the wound. In the third, Murphy, Case XIX., the peritonitis seems to be a general infection of the peritoneum, to judge by the progressively increasing temperature. The absence of the post-mortem report leaves the source of the infection undetermined.

In three cases, X., XIII., and XIV., the fatal result seems due to the impossibility to re-establish the function of the liver. The post-operative results show no clinical signs of infection, and the post-mortem in each case finds no abnormal cause other than the pronounced cirrhotic condition of the liver. In Case X., Terrier's, the histological examination showed great alteration of the organ, noted particularly for "the atrophy of the hepatic cells, the sclerosis of the intercellular connective tissue, manifestly originating within the liver-ducts themselves, which were markedly transformed by sclerosis." Duplay and Doyen both accuse the cirrhosis of the liver, the insufficient hepatic function, as the fatal factor of their cases. One patient, Quénu, Case XX., was lost by a peculiar accident; and being the only case in which a hemorrhage played a fatal rôle, we reproduce a part of the history.

Operation.—February 14, 1894. In the common duct a stone as large as an olive can be felt, which is easily displaced towards the duodenum. Incision of the duct, the edges of which are held by forceps, and with the aid of a director the calculus is removed. The common duct sutured with five points of fine silk, suture of the gastro-hepatic omentum, and isolation of the field of operation. Drain placed in the cavity. Suture of the abdominal wound. Iodoform dressing. The patient vomited three times during the afternoon. Between 7 and 7.30 P.M. she vomited a little blood and some bilious matter. At 8 P.M. another vomit of blood. The quantity of matter vomited each time is estimated at eight tablespoonfuls. Temperature, 98° F.; pulse, 90.

February 15. Vomited several times, each time a small quantity of black liquid. The dressing, in which is noted a small quantity of blood, is changed. No trace of gall could be found in the dressing. She has passed four hundred grammes of urine since the operation, and seems to be a little less jaundiced. Temperature in the evening, 100.4° F. Gas passed *per anum*.

February 16. Temperature, A.M., 100° F. She has vomited once. Tongue dry, face drawn, agitation, subdelirium, great prostration. Within forty-eight hours the skin has again become very yellow. Every symptom of cholæmia. A trocar plunged into the gall-bladder fails to give issue to any liquid. Urine five hundred grammes. Injection of two hundred grammes of artificial serum. Temperature, P.M., 101.5° F. Death during the night.

Post-mortem.—*Stomach*: full of bile. The intestine and omentum stained green. No traces of inflammatory adhesion. The large intestine contains colored matter,

in the centre of which is found a putty, chalk-like substance. The *pancreas* appears normal. The *kidneys* yellow, but without apparent alteration. The *spleen* is small. The *small intestine* is coated internally with blackish matter, which increases in quantity as the duodenum is approached. The *duodenum* is greatly dilated, and adherent to it is the bottom of the gall-bladder, which cannot be detached. This extremity of the gall-bladder is separated from the border of the liver by a distance of one and a half inches. The base of the bladder adheres to the liver on all sides, forming a centre of retraction, the traces of which are seen in the lines radiating over the surface of the liver; and here are manifestly the alterations due to perihepatitis. The *gall-bladder* is extremely small, atrophied, thick, and full of thick, colored matter, a mixture of blood and bile. The *cystic duct* is absolutely free, a probe introduced by the orifice penetrates easily into the hepatic duct or into the gall-bladder. The *common duct* is found plugged with coagulated blood, the sutures of the duct are intact. The canal is now incised for its entire length, as also the gall-bladder, the cystic and the hepatic ducts; all are found filled with the same black matter that was found in the gall-bladder.

This is the only fatal case due to hemorrhage that we have found; but in several of the other histories it would seem probable that a similar but slight hemorrhage had taken place in the interior of the common duct, causing a temporary reobstruction of the passage, or manifesting itself by the slight oozing of blood from the gall-bladder, which had been utilized for a supplementary cholecystostomy. Details of the two remaining deaths are lacking. The case of Billroth was operated by the surgeon, believing that he performed a cholecystostomy. The post-mortem revealed that the dilated common duct had been mistaken for the gall-bladder; details as to the cause of the fatal result are not given. Van der Veer not only fails to report the post-mortem of his case, but even forgets to note the post-operative temperature.

SUMMARY.

Of the twelve deaths, three are due to operation *in extremis*, three to the loss of the hepatic function beyond repair, three to peritonitis, one to internal hemorrhage, and two to an unknown cause. One-half of these, the first six, can be declared the direct result of too long postponement of the surgical intervention.

CASE I.—Communicated by Dr. Jaboulay, Table I., No. 8. Chronic jaundice; calculi in the common duct; angiocholitis and suppurative peri-angiocholitis; extra- and intrahepatic abscesses; immediate intervention *in extremis*; choledochotomy; death.

Man, aged thirty-one, brought from the medical ward of Dr. Charnicel for immediate operation. The jaundice of the patient had of late rapidly increased. The liver was very large and painful. Unremitting fever, 104.9° F. to 105.8° F.

Operation in June, 1891.—Incision on the median line. The gall-bladder empty, retracted, and adherent. The finger, introduced as far as the pedicle of the liver, feels a large stone. Incision of the duct. The calculus adheres to the walls, and can be detached only by crushing and scraping out the pieces with a curette. The inferior surface of the liver, before the extraction of the stone, showed two small, white masses, one near to the bladder, the second close to the suspensory ligament. There were abscesses simulating tumors of secondary infiltration. The region be-

neath the liver was packed with long strips of iodoform gauze. The abdominal incision then reduced by suturing. Death during the night of the following day. The temperature fell from 104° F. to 102.2° F., and thence to 100.4° F. The coma had never ceased.

Post-mortem.—Inflammatory adhesions on the right lobe of the liver. Serous matter in the peritoneum. The blackened liver weighed two thousand six hundred grammes. The gall-bladder, as large as an English walnut, adhered to the transverse colon. The common duct started directly from the bladder, the entire cystic duct having disappeared. The common duct, greatly enlarged, contained in its superior third the *débris* of the stone extracted during the operation. The intrahepatic ducts, the hepatic duct, and its branches of bifurcation were greatly dilated. The liver was hard, of dark yellow color on section, and peppered with abscesses, most of them small, but two or three as large as eggs.

CASE II.—Also from Dr. Jaboulay, Table I., No. 18. Of the same type.

Man, aged thirty, operated *in extremis* in April, 1893. Suppurative miliary angiocholitis. The left lobe of the liver was particularly enlarged. Three calculi superposed in the common duct.

CASE III.—Communicated by Dr. Jaboulay, Table I., No. 22. Chronic jaundice; calculi in the common duct; choledochotomy; recovery.

Miss R., aged fifty, long time syphilitic. Hepatic colic for five years, exceedingly painful, and more and more frequent. Three years ago a cure at Vichy was tried. For two years the patient has been confined to her bed.

Complexion of a greenish hue; urine dark-brown; stools completely decolorized; fever from time to time. She has ideas of suicide that she has confessed to her family physician.

Operation.—August 19, 1894. Incision on the median line. The gall-bladder of ordinary dimensions. The liver pushed upward exposes a cavity, limited in front by the liver, behind by the anterior surface of the gastro-hepatic omentum, and beneath by the pylorus and stomach. Two calculi are felt in the common duct. Incision directly upon them and extraction of two large stones about two centimetres square. The common duct is as large as the femoral artery and its walls as thick as those of an artery. Two catgut stitches close the incision. Iodoform packing which was removed ten days later. The patient left the hospital nineteen days after the operation. One month later the fistula closed, and April 17, 1895, her family physician reports her in excellent health, with rosy complexion and a gain in weight of twenty-five pounds.

CASE IV.—Communicated by Dr. Lauenstein, Table I., No. 17. Chronic jaundice; calculus in the common duct; choledochotomy; recovery.

Woman, aged thirty-five, operated upon March 16, 1893. For five years she had suffered with hepatic colic. Jaundiced the last three months. Discoloration of the stools. Gall-bladder imperceptible. The liver of greatly increased volume, painful when pressure was brought upon the superior part of the epigastrium.

Operation.—Long incision upon the external border of the right rectus, exposing the dark liver of increased size. The gall-bladder contracted behind the sharp edge of the liver. The bottom of the bladder adhered to the omentum, its walls thickened and white, containing no stone, but deeper down, near the duodenum, could be felt a large calculus, slightly movable. Long incision of the common duct, the edges maintained with two thread loops. Considerable hemorrhage. Extraction of the

calculus of ovoid form, its maximum diameter 2.25 centimetres, minimum fifty millimetres. Suture of the wound in the common duct with seven catgut stitches. Iodoform packing on the suture line. Dressing.

March 19. A flow of gall from the wound; repeated the 20th. Three stools colored by the bile on the 21st. Another stool the 22d. No further flow of gall from the wound.

April 2. The fistula had closed completely; the jaundice had disappeared. Rapid recovery.

CASE V.—Communicated by Professor Duplay and Dr. Demoulin, Table I., No. 24. Biliary lithiasis; hepatic colic; chronic jaundice; calculus in the common duct; choledochotomy; death from insufficiency of the hepatic function.

Woman, M. R., aged thirty-six; domestic; entered the Hôtel Dieu, ward Nôtre Dame, bed eleven, January 19, 1895.

Menstruation at the age of fifteen, has borne four children, all of whom died of acute affections. The patient was never ill anterior to 1892. Three years ago, without appreciable cause, she was taken with abdominal colic of maximum intensity about the navel and epigastrium. The colics were accompanied by vomiting, and, soon after, her stools were discolored. This condition lasted eight days, but the patient was confined to her bed for a month after the disappearance of the painful crises, because of some feverish illness, the nature of which she cannot define. During this time, at different intervals, she suffered from colic, but of a less painful nature than the first attacks. She then was intensely jaundiced for six weeks, when all became normal again. A year ago the patient yellowed but without colic, and her general health remained good. Six months ago, the jaundice not having disappeared, she was taken with hepatic colic which has not since ceased. For the last three months, the crises reappeared every week, and lasted for about twelve hours. In November, 1894, the patient was cared for at the Hôpital St. Antonie, by Drs. Ballet and Harrot, and the latter on account of the persistent jaundice recommended a surgical intervention.

Actual Condition.—January 20, 1895. The patient is in good condition, says that she has not lost flesh since the beginning of her trouble, nevertheless she has had no menstruation for three months and is not pregnant. The jaundice is very pronounced and causes a disagreeable itching, but there is no cutaneous eruption. The appetite is good, no constipation, daily stools, discolored matter of foul odor. The quantity of urine for twenty-four hours varies between seven hundred and one thousand grammes, of a dark-brown color, and containing a large proportion of urobilin. All of the internal organs appear to be healthy. Careful examination of the liver fails to detect its increased volume. The gall-bladder is not distended. There is no appreciable tumor. The hepatic colic, persistent jaundice and discolored stools, in the presence of the good general condition of the patient, the absence of fat in the fecal matter, and particularly the non-distention of the gall-bladder determine a diagnosis of chronic jaundice due to stenosis of the common duct by stone, and a laparotomy is proposed to confirm the diagnosis and to permit the suitable intervention.

Operation.—February 7, 1895. Chloroform. Median incision, from the xiphoid cartilage to the navel, a length of fifteen centimetres. Hæmostasis. Incision of the parietal peritoneum. The right edge of the incision drawn well outward; the hand introduced into the abdominal cavity can easily explore the convex surface of the liver, but cannot reach the inferior surface. Numerous adhesions between the transverse colon and the liver are slowly detached without great difficulty, and cause only

an insignificant hemorrhage. The edge of the left lobe of the liver is now exposed, but insufficient work-room necessitates the transverse incision of the right rectus at the costal border. The liver is now exposed, of abnormal appearance, a dark-yellow color. An assistant draws the border of the liver, which projected a little beyond the costal arch, upward, and thus allows the easy exploration of the inferior surface, the anterior portion of which is irregular, due in part to the broken adhesions of the transverse colon. No trace of the gall-bladder can be found, but Spiegel's lobe is greatly hypertrophied. The free border of the gastro-hepatic omentum is carefully explored from the border of the liver to the duodenum, but without success. The head of the pancreas is found unaltered, with no trace of neoplasm or calculus. The finger is now introduced into the narrowed foramen of Winslow, feels immediately a hard stone in the dilated common duct, a few centimetres beneath the inferior surface of the liver. An effort to seize the stone between the thumb and forefinger only succeeds in pushing it higher up, whence it is brought down with some difficulty and there maintained by an assistant. Sterilized towels are introduced to protect the abdominal cavity from the gall, and the common duct is incised directly upon the stone for a length of one centimetre. The immediate venous hemorrhage that took place was sufficiently severe for a moment to cause a suspicion that the vena porta had been wounded, but a rapid compression of the region soon stopped all bleeding, the source of which was then recognized in the walls of the dilated common duct. The assistant then easily succeeds in enucleating the stone from its lodge. The extraction of the calculus is followed by oozing of a few drops of thick black gall. The edges of the incision of the common duct are sewn with three silk stitches. Careful toilet, Mickulicz packing with three bands of iodoform gauze, one passing beneath the inferior surface of the liver, the two others to the right and left of the wound of the common duct, against the coils of the intestine. Complete suture of the transverse incision of the abdomen and partial suture of the vertical wound by which the extremities of the gauze bands are brought out. The operation lasted one hour and a quarter. The patient was greatly depressed on recovering from the anæsthetic; two hypodermic injections of ether were given. Six hours after the operation the shock was still manifest. Temperature 97.7° F. The dressing is examined and found saturated with blood, but no real hemorrhage. No flow of gall could be detected. During the night, champagne, injections of ether, and thirty grammes of artificial serum were administered.

February 8, A.M. Condition much better. Temperature 98° F., but the pulse, as the evening before, is slight, rapid, and cannot be counted. A catheterization of the bladder withdraws about five hundred grammes of urine, the amount secreted since the operation. This urine is deeply colored by bile. The abdomen is not painful. The liquids taken into the stomach are occasionally vomited. Once or twice the vomited matter was like soot, but of small quantity. Same condition in the evening. Temperature 100.4° F. Pulse slight, irregular, and very rapid. Considerable agitation during the night.

February 9, A.M. Temperature 101° F. Pulse the same as before. No abdominal reaction. Agitation which ceases at noon, and death intervenes at 8 P.M., its cause unappreciable. No clinical signs of hemorrhage or of peritonitis.

Post-mortem.—February 11. No peritonitis, no blood in the abdominal cavity. The packing is stained with blood, but no trace of bile can be recognized. The sutures of the common duct, perfectly in place, did not completely close the incision. A director introduced from the duodenum into the duct passed freely along the canal, the calibre of which equalled that of the little finger. There was no stricture throughout the length of the common duct. The *liver*, of dark-yellow color tending towards green, presented a smooth convex surface. Spiegel's lobe greatly enlarged. On the inferior surface of the liver could be seen the trace of the adhesions with the

colon. The liver carefully detached from the diaphragm was removed from the abdomen together with the duodenum and a large part of the pancreas. The two last organs normal, the liver somewhat increased in size. The *gall-bladder* could not be found, but in the groove usually occupied by that organ was a slender fibrous cord, somewhat dilated towards its centre, with a small irregular cavity large enough to hold a pea. The *spleen* of normal size. The *kidneys* apparently sound. The *intestine* was without trace of bile, and this, with the absence of this liquid already noted from the packing, would seem to prove that the liver had not secreted since the operation. The *stone* was ovoid with smooth surfaces, its maximum diameter fifteen millimetres; minimum twelve millimetres.

CASE VI.—Communicated by Professor Terrier, Table I., No. 25. Chronic jaundice; hepatic colic; feverish attacks; calculus in the common duct; choledochotomy without lithectomy.

Woman, A. C., aged fifty-eight, entered the Hôpital Bichat March 6, 1895. Menstruated at the age of thirteen; always regular. Married at nineteen; has given normal birth to five children, all of whom died young. At the menopause, at the age of fifty-two, she had during several months attacks of severe metrorrhagia. Has never had an infectious disease. In 1874 she had a great deal of pain, commencing at the epigastrium, passing under the right costal arch and radiating into the shoulder of the same side, causing a continuous dull ache with acute crises from time to time. This condition lasted for eight months, but during this time there was no jaundice. Good health from 1874 to 1879. In August, 1889, the hepatic colic recommenced and lasted a month, again without jaundice. In September, 1893, the colic appeared again, but less violent than during the other attacks. One month later, without any reappearance of pain, the patient became jaundiced, and has since remained so with slight variations in intensity. Since the very beginning of the coloration of the skin, the patient has remarked the discoloration of the stools and that the urine was deeply stained with the bile pigments. As the icteric condition became more marked, the severe attacks of hepatic colic were less and less frequent; but the patient felt and continues to feel almost constant pain at the epigastrium and under the right costal arch, a pain which the patient declares has never left her for the last eighteen months. About a month after the appearance of the jaundice the daily attacks of fever with chills and sweating commenced, hepatic intermittent fever reappearing each evening from November, 1893, to September, 1894. The weight of the patient, normally about one hundred and seventy pounds, until August, 1893, diminished to one hundred and twenty-one pounds in March, 1894, and actually she weighs only one hundred and seventeen pounds at present. Medical treatment for the last year and a half has produced no result.

Actual Condition.—Jaundice very intense, daily stools absolutely discolored. Urine deeply dyed with biliary pigments. The liver of largely increased volume, its inferior border easily perceived by palpation, passes the costal margin a distance of two inches on the axillary line of two and a half inches on the mammary line. The liver traverses the epigastrium obliquely; its border, perceptible four inches below the xiphoid cartilage, disappears beneath the left short ribs and is almost in contact with the spleen, itself hypertrophied. The approximate vertical measure of the liver is five inches and a half on the mammary line, increasing to seven and a half inches in the anterior axillary line. Following the sharp edge of the liver, at a point a little to the inside of the vertical mammary line, the niche of the gall-bladder can be distinctly felt, but at this spot the most careful palpation cannot discover the bladder itself. By this examination it is found that the maximum pain is placed by the patient at a spot nearer to the median line than the above described niche, between this and the navel. The spleen is greatly hypertrophied: its inferior edge

at four fingers' breadth beneath the costal border, touches the brim of the pelvis, its superior limit, denoted by the dulness of the percussion note, is found three inches above the costal arch, surpassing by a finger's breadth the cartilaginous point of the tenth rib. The diameters of the spleen are estimated at seven inches for the vertical, six and a quarter for the width. About a quart of urine is passed in twenty-four hours, acid in reaction, density 1013, containing seventeen grammes of urea per litre. No albumin; no sugar. A great quantity of bile pigments. To examine the function of the liver, the patient is given, March 15, on an empty stomach one hundred and fifty grammes of sugar syrup. The urine, examined hourly for the six following hours, contains no sugar. Actually the patient is not suffering from febrile attacks.

Operation.—March 19, 1895. Vertical incision on the external border of the right rectus. The edge of the large liver is situated low down in the abdomen. Some adhesions of the omentum to the liver are detached and two silk ligatures applied to bleeding points of the omentum. The gall-bladder, completely atrophied, cannot be found. The edge of the liver held up with a spreader, the parts having been protected with sterilized towels, the hands of an assistant keep the intestinal coils pushed down and to the left. The right index explores the pedicle of the liver, but without success. The left index, introduced and placed beneath the pedicle while the right index explores the anterior surface of the liver, discovers towards the duodenum a stone as large as a pea and movable. The great hypertrophy of the liver increased the depth of this portion of the common duct and caused considerable difficulty in gaining access to the canal. The finger kept upon the stone served as a guide for the introduction of a Reverdin needle, the point of which struck a hard substance, and a cotton sponge applied to the pricked wall brought out a few drops of gall. Still using the finger as a guide, a small incision was made in the wall, incision immediately followed by venous hemorrhage. A momentary compression diminishes but does not stop the bleeding, and two pressure forceps are applied temporarily to the bleeding points. These, with a short compression, complete the hæmostasis. After this the stone is again sought for at the place incised, but the finger feels it only to let it escape beneath the liver, where every effort to find it was unavailing. The wound carefully packed, the larger part of the abdominal incision was closed with sutures in three planes; the peritoneum with fine silk, the aponeurosis with larger silk, and the skin with silkworm gut. Dressing of sterilized gauze covered with sterilized cotton and the whole kept in place with a flannel bandage.

In the evening the patient was in good condition. Temperature, 98° F.; pulse, 85; respiration, 30. She has vomited twice during the day.

March 20. At the dressing there was a slight oozing of blood. A part of the packing is removed. Temperature, A.M., 99.5° F.; pulse, 80; respiration, 24. Temperature, P.M., 99.8° F.; pulse, 86; respiration, 24. Seven hundred grammes of urine in twenty-four hours.

March 21. Removal of almost all of the packing. Gas passed *per anum*. Urine, eight hundred grammes. Temperature, A.M., 98.4° F.; pulse, 80; respiration, 20. Temperature, P.M., 98° F.; pulse, 80.

March 22. The rest of the packing replaced by sterilized gauze, slight oozing of yellow matter. An enema provokes yellow stools. Urine, nine hundred grammes, not so deeply dyed. Temperature, A.M., 97.6° F.; P.M., 98° F., and continued normal during the convalescence. The jaundice disappears.

March 23. Dressing. Slight oozing of greenish-yellow matter.

March 24. Dressing. Slight oozing of greenish-yellow matter. An enema gives yellow stools. Jaundice diminishing.

March 26. Removal of the stitches; enema; yellow stools.

March 27. Slight flow of greenish matter. Stools normally colored.

March 29. Flat dressing.

April 3. Minimum flow from the fistula.

April 5. Cauterization of the fistula; dressing with vaseline and sterilized gauze.

April 7. The patient leaves her bed and quits the hospital.

April 12. The jaundice has almost entirely disappeared. There remains only a slight trace on the upper portion of the thorax. The conjunctivæ are white. The mark of the abdominal incision measures five and a half inches. The union is solid and supple. A little more than an inch below the superior extremity a small opening is seen, remaining from the fistula, which secretes a very slight quantity of liquid. Stools and urine normally colored. Appetite, digestion, and sleep all excellent. No pain whatever in the hypochondrium. April 16, the fistula closed. Some time after the return of the patient to her home she was taken with acute pneumonia, and on May 23 and 24, probably influenced by her cough, the fistula reopened to give issue to a little blood, but no gall. The hemorrhage, probably due to the fistulous walls, rapidly ceased under compression. The jaundice had entirely disappeared. The stools were colored. June 15 the patient was again seen. No jaundice; stools, normally colored, but the condition of the lungs was extremely bad. Death as a result of pneumonia at the end of June.

(To be continued.)

A CASE OF SIMPLE SEROUS RECURRENT PLEURAL EFFUSION: ITS FINAL OUTCOME.

BY J. C. MULHALL, M.D.,

St. Louis.

MR. J. L. G. C. was sent me March 1, 1893, by his physician. There existed on the left side the classical symptoms of a serous effusion, confirmed at once by the hypodermic needle. His history was that four months before he had been suddenly seized with pain in the side, fever, general prostration, dry cough, and dyspnœa, most probably, therefore, a simple pleurisy, *ab initio*. The diagnosis, however, was pneumonia, and, as after six weeks dulness and dyspnœa still existed, he was sent to California. Here the dyspnœa increased, and, without consulting a physician, he returned, imbued with the idea that he preferred to die at home. When crossing the mountains outward and homeward bound he noticed great increase of dyspnœa. He was placed under my care.

He was a small, slender man, of sallow complexion, bad digestion, constipated habit, phosphatic urine, and with arteries somewhat resistant. He was forty-four and, though not a drunkard, had used whiskey immoderately. Taking into consideration that the effusion had lasted four months, that he was beyond the elastic age, that his general health was bad, a most guarded prognosis was made as to the future usefulness of the left lung. Sixty-two ounces of serous fluid were removed at the first tapping, with considerable relief to the dyspnœa, without complete cardiac

replacement. In three weeks there was reaccumulation of fluid, during which interim repeated examinations disclosed no vesicular murmur. During the next six months the pleural cavity was tapped eight times, the fluid gradually diminishing in quantity, the ninth tap yielding only forty ounces. There was still no vesicular breathing to be heard. About this time he became impatient and asked, "What is the final outcome of this to be? Am I to be indefinitely tapped? Cannot something radical be done to prevent the reaccumulation of the fluid?" These questions, from my own personal experience and from our somewhat limited literary resources at St. Louis, I could not answer, and they form the motive for my report of this case.

By means of cold water surface friction to the skin, a rigid dietary, percussions over the liver, abdominal massage, flexure and extension of all the joints, daily open-air driving, the tongue had become clear, the bowels moved without drugs, the urine had become normal, the general health was greatly improved. There was rapid compensatory enlargement of the right lung. The patient could walk a mile, slowly, with but slight dyspnoea. The propriety of performing Estlander's operation I discussed with several of our best men. Opinions were various. Like myself, not one had ever known multiple rib resection to have been performed in such a case. In view of his great improvement and of the unknown danger of Estlander's operation in such a case, I compromised matters by sending him to Denver to be aspirated there, thinking that, though expansion of the left lung was hopeless, compensatory enlargement of the right lung would more rapidly develop at such an altitude. Dr. Lemon, at Denver, aspirated him twice in thirty days, when, for reasons foreign to his health, he returned to St. Louis. The ratio of improvement was not greater than at home. Within the next four months I aspirated three times. On the last occasion, but thirty ounces of fluid could be, with difficulty, removed. The right side had greatly increased in all diameters, vesicular resonance being found four inches below the nipple. He was able to attend to his ordinary duties, those of book-keeper and assistant manager of a detective agency. The whistling respiration audible ten feet away at our first interview had quite disappeared. He was satisfied at once more being able to earn his salary. My intention was to tap the side every two months, in order to give occasional impetus to the expansion of the right lung. Thus, thirteen months from the first aspiration a practical cure may be said to have been effected. Two months later I was called to see him and found him to be suffering from an acute attack of what I judged to be *la grippe* of the cerebral and abdominal type with no involvement of the respiratory organs. I placed him under the care of another physician, who concurred in the diagnosis. He lingered two months, and died. At the autopsy the cause of death was found to be tuberculous peritonitis. The right lung was healthy and very large in proportion to the anatomy of the rest of the body. The left was an airless stump, bound to the vertebral column. The

pleura, parietal and diaphragmatic, had thrown out inflammatory material, which, in coalescence with the pericardium, had filled up the lower portion of the pleural cavity. This, assisted by the remains of the left lung and the encroachment of the right lung on the left side, left a cavity which contained twenty-five ounces of serum. Sections from the left lung showed various phases of connective-tissue proliferation. It would seem, therefore, that in simple, serous, recurrent, pleural effusion, even at middle age or beyond, repeated aseptic aspirations, with general hygienic measures, may effect a practical cure without expansion of the affected lung, and that a year or more may be consumed in this manner before multiple rib resection is practised.

Since writing the above I have read the London correspondence of the *New York Medical Record* of May 25, 1895, that, at the Medical Society of London, Dr. S. West related the case of a woman, aged thirty-one, whose chest he aspirated thirty-seven times within a year. With misgivings, he consented to the chest being opened. An empyema developed and for a time her condition was critical, but ultimate recovery and expansion of the lung ensued. Dr. Hall said it was always undesirable to open the chest in simple serous effusion, and that he would tap seventy times seven, if need be, so long as the effusion is clear.

My case seems to teach that even when the lung will no longer expand a practical cure may be effected without opening the chest.

CLINICAL LECTURES.

LIGATURE OF THE INNOMINATE ARTERY.

CLINICAL LECTURE DELIVERED AT THE BOSTON CITY HOSPITAL.

BY HERBERT L. BURRELL, M.D.,

Surgeon, Boston City Hospital; Assistant Professor of Clinical Surgery, Harvard University.

GENTLEMEN,—The case which we have before us this morning is one of aneurism of the innominate artery, and undoubtedly my colleague, Professor Mason, has told you the history.

The medical history of the case is as follows: The patient, a male, R. F., was fifty-four years of age, married, a clerk, and was under the care of my colleague, Dr. A. L. Mason.

The family history was as follows: The father died of old age; the mother, a brother, and one sister died of consumption; three sisters are alive and well.

The present history is as follows: The patient had always been well until two years ago, when he noticed a little shortness of breath. He had never had any venereal disease, rheumatism, or chorea. He had never worked very hard, nor was he of a nervous temperament. About eighteen months ago he noticed a "lump in his throat" on the left side, which, on exertion, seemed to throb and to choke him. There was no pain. The lump has increased in size but very little. About a fortnight before entrance he had to walk some distance, since which time he has had some dyspnoea and the choking sensation has increased. The patient sleeps well, his appetite is good, his bowels are regular, and there is no palpitation of the heart.

Physical Examination.—The patient is well developed and nourished. The tongue is clean. The pulse is regular, of good strength and volume. The heart area is enlarged one finger's breadth to the right of the sternum. The apex is in the fifth interspace, one-half inch to the outer side of the nipple. Over the entire præcordia is heard a blowing systolic and a sharp diastolic murmur, especially over the aortic region. This is transmitted upward and outward into the axilla, and is heard also faintly over the back at the level of the sixth dorsal spine. There is a marked pulsation of the vessels of the right side of the neck, where there can be made out a well-marked expansive thrill and a systolic bruit.

Lungs: Good resonance and respiration over all.

Liver: Dulness from fifth rib to one inch below the costal border.

Spleen: Area not enlarged; edge not felt.

Abdomen: Lax, tympanitic, not tender.

Extremities: There is a well-marked pulsation in the vessels at both elbows and wrists, and also in the posterior tibial artery behind the internal malleoli, especially on the right side. At these places a faint systolic murmur can be made out synchronous with the heart's action. No œdema.

Examination of eyes negative.

Urine: 1016, pale, acid, no sugar, slight trace of albumin. No examination of sediment recorded.

Temperature normal.

From a surgical stand-point aneurisms are of peculiar interest. Broadly speaking, there are two principal ways of curing a local dilatation of a blood-vessel; one by obtaining a clot by external pressure, the other by causing a clot to form in the aneurism by the injection or introduction of materials into the cavity or irritation of the internal wall of the sac to produce a clot. The first method may be divided into pressure by the thumb and fingers, and if it can be carried out for hours may finally produce a clot, organization and obliteration of the sac. There are five methods of treating an aneurism by ligature. First, on the cardiac side at a distance from the tumor; second, on the cardiac side near the tumor; third, on the distal side of the aneurism; fourth, on a distal branch; fifth, proximal and distal ligation of the aneurism itself.

We then come to those things which are used inside the sac to coagulate

the fibrin : chloride of iron has been injected, but has been discarded owing to the danger of embolism ; a method which has attracted a good deal of attention is the introduction of wire, through a trocar ; this forms a coil inside the sac, and engages the fibrin, producing by its presence a clot ; the last method which has been attended by some success is termed "needling," and was introduced by Macewen ; a fine, strong, long needle is plunged into the aneurismal sac and the intima is scratched at various places until a mass of fibrin is deposited which gradually obliterates the sac.

Now, we have these different methods of dealing with this aneurism. Its situation fills one with a good deal of thought. A very important question is whether this aneurism involves the common or subclavian, whether it involves both at their junction, or whether it extends down onto the innominate artery. The innominate, so far as I know, has only been ligated eighteen times ; of that number sixteen have died, and two only have been successful. The innominate artery, you know, is only one and a half to two inches in length, and its lumen is nearly the size of my thumb. At its origin it is covered by a portion of the vagus nerve and by the left innominate vein ; on its right side the pleura and the vagus nerve lie in contact with it. On the left side it has the left carotid artery, and behind the trachea ; so, as you can readily appreciate, we have a vessel springing from the aorta, surrounded by extremely important structures.

It is interesting to note the cause of the deaths that have occurred. There have been three things that have killed patients after ligature of the innominate : first, suppuration ; second, secondary hemorrhage, and, curiously enough, from the distal end of the vessel which has been tied. All sorts of tendons have been advocated for securing the vessel,—kangaroo, ox-tail, and various round and flat ligatures. If I tie the vessel I shall use a flat silk ligature, and arrange my knot in a flat, square knot, because the deaths from secondary hemorrhage are usually from where the knot has perforated the wall by erosion. The third manner of death has been from shock, which I hope we can avoid.

Now, the operation which has been done in these cases has been the exposure of the lowest part of the carotid and subclavian as they spring from the innominate, by dividing the sterno-cleido-mastoid muscle low down, and insinuating a ligature on the innominate behind the sternum. I do not believe in this kind of surgery ; it is surgery in the dark, and is necessarily blind. If I tie the innominate, I shall take out a portion of the sterno-clavicular articulation, in order that I may see plainly what I am doing.

At once there is presented to one's mind the danger of wounding the innominate and the vessels which lie directly between the sternum and the artery. It is not unlike trephining over a lateral sinus. If I wound a vein there will be a profuse hemorrhage, for which reason I propose to expose the upper part of the vessel first and slip a spatula beneath the sternum,

and trephine upon that. If I find an extension of the aneurism downward onto the innominate so that I cannot secure a sound vessel proximally, I shall be forced into ligating the common carotid, subclavian, and probably the vertebral. The first thing to do is to define accurately the position of the aneurism; that can only be done by freely exposing the parts; then we shall have to be guided by circumstances as we go on.

The limits of pulsation in this case can, I think, by close attention, be seen; you can see my fingers rising and falling and the sac pulsating. The first step in the operation is an incision through the skin, from the point where the right carotid divides down to the sternum; a transverse incision is now made outward on the clavicle to the junction of the inner and middle thirds. We come immediately onto the external jugular vein, which is divided. These large veins as they present themselves can be easily controlled by pressure forceps. It is, of course, important to save all the blood that we can, to avoid shock as much as possible, so that as these small veins present themselves it is better to divide and tie them.

Now we come down to the deeper structures of the neck. I will let Dr. Cushing expose the full length of the carotid artery. For a moment let us consider what we are going to accomplish by exposure of the common carotid. The moment we divide the deep cervical fascia and can place our finger on the line of that vessel, we shall be able to determine the upper limit of the aneurismal sac; then, I hope, by raising up the sterno-cleido-mastoid,—certainly by dividing it transversely,—we shall be able to get the external limit of the sac. By careful dissection with the handle of the knife one can expose the vessels in this region with but little risk. It is one of the attractive things in any operation in surgery to accomplish a great deal with but little destruction of important structures. The omo-hyoid now presents itself, and I divide it in order that I may have a freer exposure of the sac. I now have the tumor fairly well exposed, and you can all see it is pulsating strongly. I now make an incision directly upon the inner part of the clavicle, the skin being pulled a little, in order that the flap shall slip up on the neck. This flap of skin is quickly retracted, and now comes the division of the sterno-cleido-mastoid. I will cut the inner part of that muscle first, and if I find it necessary I shall divide the whole of the sterno-cleido-mastoid.

In this operation there is one danger which must be constantly borne in mind,—that is, opening a vein and admitting air to the circulation. For that reason I am going to ask Dr. Cushing to have at hand a sponge with sterile water in it, so that if by accident I should plunge into a vein, he can immediately fill the wound with water. Now we come down to the sterno-thyroid, which is divided and laid back; it readily retracts of itself, owing to the position of the head. Personally I am opposed to the use of a director; it has a sharp point, and it tears structures at times in a most unpleasant way. The accurate division of tissues with a knife is to be preferred.

Here is the sterno-hyoid, which is divided. At times, in looking at an operator, it seems as if one were using a great deal of force in the wound. This should be carefully avoided, for the tearing of tissues should be avoided.

I think, gentlemen, you can identify these structures: here is the carotid artery greatly enlarged; here is the innominate, and this big vein, the internal jugular, puffs back and forth in a most suggestive way, that if it were pricked it would suck in air. Now, the question is whether the subclavian is involved or not. I shall divide these remaining fibres of the sterno-cleido-mastoid which I had hoped to keep, and which it is obviously impossible to save. I have exposed all of the subclavian artery that will be possible; of course, the second part is hidden by the scalenus anticus, and the third part must be practically under my fingers at this minute. I can feel the tubercle of the first rib plainly, and this must be the first part of the vessel, and it is not enlarged. We must find the limit of this sac. It is not going to be possible for me to insinuate my finger beneath the sternum at this point and to define any enlargement of the innominate.

I shall now take out the right sterno-clavicular articulation, so that I can see the lower limit of the aneurism. Dr. Cushing says that it seems as if we were almost at the bottom of the enlargement. I shall feel better when I see the bottom of the enlargement. I will first clear away the structures which lie in the way of taking out the sterno-clavicular articulation. I think a glance at this field of operation demonstrates the number of vessels at the base of the neck. I am going to ligature these vessels, because I don't want them in the way when I come to trephine.

As Dr. Mason has told you, this man has aortic disease as well as this aneurism, for which reason I am constantly apprehensive as to the ether or any struggling which may occur. I think it is more the struggling while going under and coming out of an anæsthetic that we have to fear than the ether itself. Dr. Lovett reports that his condition is excellent, which is encouraging.

Where my forefinger rests is the apex of the sterno-clavicular articulation; this is the sternal notch; here is the first rib; here is the articulation itself. If I can insinuate a broad, flat retractor of copper between the vessels and the sterno-clavicular articulation in trephining, I shall feel safe. I can, however, introduce my finger beneath the sternum, so that I can slide in a spatula, and this will protect the vessels.

I am going to ask Dr. Cushing to do the trephining, because the moment this is completed I shall come down to the innominate artery, and I shall have to delicately use my fingers. The force necessary to do the trephining might make my hand shaky. All we propose doing with this small trephine is to honeycomb this suprasternal notch and the articulation, so that with less force the bone forceps can pluck out and enlarge this notch.

Dr. Bolles asks me a question which is interesting. It is, "How far

does the aneurism extend down?" That is what we are trying to ascertain, and the one important thing is to place our ligature on a part of the vessel which has a sound wall. If we tie through an atheromatous patch the vessel may give way at the time.

I trust you all remember the answer to the old anatomical question, "If you pass a needle through the right sterno-clavicular articulation, what vessels will you injure?" That is exactly the knowledge that is applicable here. I anticipated a good deal of trouble in getting an interspace between the sternum and these vessels, but my finger passes in readily, and it is perfectly clear that we are not going to wound any vessels.

This surgical engine, which I think you have seen used before, is a device of Dr. Bradford, and is a very powerful motor. It is difficult at times to use it on the skull unless you are familiar with the instrument; however, for gross purposes where it is important to rapidly complete an operation, the instrument is invaluable.

This bone is pretty well honeycombed on its anterior surface,—of course I have not touched the posterior surface,—and what I hope is that with the bone forceps we can remove it piecemeal without much force. I could slide one jaw of a pair of forceps under the bone and clip through with a few cuts. This would be a more rapid method, but I am afraid it would injure the structures beneath the sternum. If we should find that the patient were losing strength,—and that is a thing that one should always bear in mind in performing an operation of this kind,—we should be warranted in taking additional risks. I do not think that we shall be driven to removing the bone rapidly with bone forceps, but the time slips by, and the longer this operation goes on the greater danger to the patient. The operation has taken fifty minutes, and it will take twenty more to remove the bone by trephining; therefore, it is better, I believe, to finish the removal of the block of bone by the bone forceps.

My finger is at the extreme tip of the under blade of the forceps; I cannot see how it would be possible to injure any important structures in this way. The block of bone is now out, and the structures posterior to the upper part of the sternum are protruding and must be identified. I believe that I can now expose the sheath of the vessel and the whole of the aneurism, and it does not seem as if it extended down onto the innominate; it feels as if we were going to have a sound space on the vessel proximally.

There has been something occurring in the wound which has filled me with anxiety, and that is the presence of air. The question is where it comes from. The only explanation I can make for it is that we have wounded the pleura, as it comes up near the innominate, but that is not necessarily a fatal complication. I believe I can now apply the ligature, and I think I have reached a point on the vessel that is not diseased. This is very important. The point I have selected is a sufficient distance, I be-

lieve, from the arch of the aorta for the clot to form and organize and not slide into the aorta.

The trouble is now to pass this ligature. Of course, the rule is to pass it away from danger, but here we have danger on both sides, in front and behind the vessel. I see for the first time, or, rather, I feel a vein; it is the left innominate vein as it crosses to join the right innominate. On this side I have the vagus. The tugging back and forth here is very troublesome,—it is the tracheal tugging,—for it is operating “on the fly.” It becomes simply a question of patience on my part, and any hurry might prove fatal.

I am now directly inside the sheath of the vessel, so that with a little care on my part, I think I can separate the vessel and pass a needle with less danger than if I attempted to force it through the structures just surrounding the vessel. I am inside the sheath, so that I have no fear of the vagus. I am now trying to slide the sheath off the surface of the vessel. The reason I do not have the aneurismal needle threaded before I pass it is on account of the possible injury to the wall of the vessel; that is the one danger that I am trying to avoid.

I am going to tie the vessel in two places and cut between the ligatures to let up the tracheal tugging. Now I have passed the proximal ligature and am sinking it down towards the arch of the aorta. I am not going to tie a surgeon’s knot, but simply a perfectly flat, square knot; the additional twist in the surgeon’s knot I am afraid might erode the vessel. Get a big pair of T-forceps, so that, if by accident this should be cut through, we can seize the end. Dr. Munro calls my attention to the fact that probably the pleura is not wounded, but that the bubbling of air is due to the entrance of air into the cellular tissue at the base of the neck. This is a much pleasanter explanation than that of a wound of the pleura.

I think we now have this vessel absolutely tight. Now the thing I would like to do, but am not going to do, is to cut this vessel apart between the ligatures, so as to get rid of the tracheal tug, which must be a constant strain on the vessel, and which I cannot help feeling has something to do with the vessel having given way in so many cases. My reason for not doing it is that the distal ligature is not absolutely tight and I do not think it would be safe.

I have passed and now tie the second proximal ligature. This I do not draw so tight, for I feel the wall of the vessel giving way. Now the pulsation in the aneurism is gone. The sac has collapsed. I have tied about an inch and three-quarters, or perhaps an inch and a half, up from the end of the aorta on the innominate. The pulsation in the arm as well as in the head is gone.

The wound is now closed; the individual muscles have been sutured and the sterno-mastoid and omo-hyoid are replaced. The gap remains in the bone, but it will become obliterated by bone growth.

It is important to superimpose over this aneurismal sac all the solid

structures I can place there, because by that means I prevent the giving way of the sac or vessel and the occurrence of a secondary hemorrhage, which is the one thing that has rendered this operation fatal.

An interesting thing is how the collateral circulation will become established; it will be through the basilar, the aortic, the intercostals, the phrenic, and the epigastric, and through the vessels of the skull, coming down through the face.

[NOTE.—This patient recovered from the operation and was up and about for a number of weeks attending to his affairs. He died, one hundred and four days after the operation, of hypertrophy and dilatation of the heart and general arterial sclerosis. The innominate artery was closed and the aneurism was shrunken.]

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

Endocarditis following Gonorrhœa. (*Deutsche Archiv für klinische Medicin*, vol. lvi., Nos. 3 and 4, 1895.) By Dauber and Borst.

Twenty days after the appearance of a gonorrhœal discharge the patient had a chill with rise of temperature. Under the influence of salicylates the fever assumed that of a mild remittent form. Six weeks later another chill occurred followed by hectic fever and the symptoms of aortic insufficiency. The patient died four weeks after this. The urethral secretion had shown only gonococci at first, later it had become purulent, with disappearance of these and the appearance of the pyogenic bacteria. Cultures of the blood during life had been without result. Sections of the indurated valve showed small biscuit-shaped, non-capsulated diplococci, that decolorized readily by Gram's method. A culture of the heart's blood, however, upon human serum agar, exhibited, after thirty-six hours in the incubator, isolated punctiform round colonies that were of a yellowish-brown color and translucent. These under magnification showed sharp edges without budding, and contained diplococci in all respects similar to those found in the aortic valves. From the character of the cultures they were declared to have no relation to gonococci. The kidneys presented the usual lesions

found in septicæmia,—that is, those of acute interstitial nephritis, and some infarcts.

The writers do not deny, although they doubt, that the gonococcus can produce valvular lesions of the heart, but they lay stress upon the impossibility of making a positive diagnosis from the form and shape of the bacteria alone. In the present case they believe that the septic condition proceeded from the secondary infection of the urethra.

Hemianopsia in Uræmia. (*Deutsche Archiv für klinische Medicin*, vol. lvi., Nos. 1 and 2, 1895.) By Friedel Pick, M.D.

The author reports a case of uræmia with ocular symptoms. An acute exacerbation occurred in a case of chronic nephritis. Blindness came on suddenly in the course of the acute uræmic symptoms. At first the pupils were immobile, later they reacted well, and on the following day were fixed in myosis. The eye-grounds were negative. Examination now showed the existence of an homonymous hemianopsia sinistra. The autopsy showed an area of softening in the second occipital lobe on the right side. The ependyma was thickened and the ventricles dilated. The kidneys showed the changes of chronic interstitial nephritis. Pick concludes that the amaurosis was uræmic, and the hemianopsia the result of the area of softening. This latter was shown to be embolic. In considering this case, in connection with some others in which a transient amaurosis had completely disappeared, he discusses the theory of Traube, that uræmic amaurosis is due to the mechanical effects of œdema; and that of Rosenstein, that it is the result of the action of toxic substances, retained in the blood, upon the capillaries of the brain, producing local anæmias and possibly softening. He finally concludes that an actual lesion of the brain substance may occur in uræmia, from the fact that permanent lesions of vision do take place, and further, that permanent softenings, with their attendant focal symptoms as a direct result of uræmia, are not impossible.

The Function of the Suprarenal Capsules. (*Wiener medicinische Wochenschrift*, No. 6, 1896.) By N. Cybulski, M.D.

Under the direction of the author, Dr. Szymonowicz commenced a systematic series of experiments. The removal of one suprarenal had no effect; if, then, the second were also extirpated the animal died within ten hours. The prelethal symptoms were apathy and stiffness of the muscles, a reflex muscular contraction occurring at each attempt at movement. At last the animal lay upon its side and breathed very deeply and heavily. Erythrocytes and hæmoglobin were greatly increased. The temperature showed very slight variations. The blood-pressure sank to zero just before death. One cubic centimetre of an aqueous extract of suprarenal body (one part suprarenal, ten parts water) caused complete restoration for half an hour or more. One cubic centimetre of the ten-per-cent. solution injected into a normal animal caused great increase of blood-pressure, far exceeding the physiological

limit, slowing of the pulse-rate, and increase of the respiratory rate. Sometimes, in small animals, there was primary increase of the pulse-rate, due, the author thinks, to temporary paralysis of the vagus centre. By section of the spinal cord and the vagi the action was determined to be upon the centre of the medulla, and entirely of a stimulant character. It was further determined that an extract of the medullary portion of the gland was twice as strong as an extract of the cortex. By its action in various solutions Cybulski believes that the active principle is of the nature of a base.

Estimation of the Leucocytes in the Urine and their Value in Diagnosis. (*Berliner klinische Wochenschrift*, December, 1895.) By Karl Reinecke, M.D.

In the cases examined the number varied from fourteen hundred to one hundred and fifty thousand pro cubic centimetres. The method employed was to place a drop of urine, after thorough shaking, upon the Thoma-Zeiss slide, and count as if a mixture of blood. If more than forty thousand pro cubic centimetres were present, a three-per-cent. solution of sodium chloride was used for diluting. The importance of the procedure lies in the possibility of the recognition of nephritis when pus and albuminuria are both present. About one hundred thousand pus cells pro cubic centimetres cause one per cent. of albumin in the urine. The two chief sources of error are imperfect mixing and the presence of mucus, holding the corpuscles in clumps. In ammoniacal urine the results cannot be trusted. Aside from the determination or exclusion of the presence of nephritis in cases of pyelitis and cystitis, the method is useful in order to ascertain the effect of treatment and the course of the disease.

The Diagnosis of Changes in the Size, Position, and Motility of the Stomach in Cases where Intragastric Instruments cannot be used. (*Medical News*, January 18, 1896.) By Boardman Reed, M.D., of Atlantic City, N. J.

In cases where, for any reason, the introduction of the tube into the stomach is not permitted, the physical examination by the combined use of clapotement and percussion gives satisfactory results. If in any case clapotement and percussion do not agree in their testimony, we should be guided by the latter as being less likely to deceive. It is best to examine the patient at a time when the stomach should be entirely empty. Examine the patient first by clapotement and then map out the boundaries by percussion, at first in the recumbent and then in the standing or sitting posture. Then have the patient drink an eighth or a quarter of a litre of water and repeat the processes. By this combination of methods the following kinds of stomachs can be differentiated: First, a stomach of normal size, in normal position, and having sufficient motor power. Second, a stomach normal as to size and position, but weak in motility, gastric atony. Third, an enlarged stomach with strong motor power, the megalogastrie

of Ewald. Fourth, an enlarged stomach with weak motility, dilatation, or gastrectasia. Fifth, a stomach wholly displaced downward, but otherwise normal, not enlarged, the gastroptosis of Glenard. Sixth, a stomach both enlarged and displaced downward as a whole, but not dilated; motility good, megalogastrie with gastroptosis. Seventh, a stomach wholly displaced downward and dilated, weak motility, gastroptosis with gastrectasia. Eighth, the pyloric end of the stomach displaced downward and swung around to the left, but without dilatation. Often the pylorus is carried down almost, if not quite, into the long axis of the fundus, producing what is called the vertical or subvertical stomach, according to the degree of the displacement. This form may be appropriately called pyloroptosis. Ninth, the pyloric end of the stomach displaced, as in the previous variety, and also dilated, pyloroptosis with dilatation. In the normal stomach no splash will be obtainable until after the viscus has been partly filled, and then either none or a feeble one, heard not lower, as a rule, than midway between the lower end of the sternum and the umbilicus. Percussion, especially with the patient standing after drinking water, will demonstrate the boundaries in normal place. In the atonic stomach the splash may possibly be heard four to six hours or longer after a full meal, or, if not, the drinking of a very small quantity of water will develop it decidedly. Percussion will show delayed emptying of the organ. In megalogastrie the upper border of the viscus will be found in the normal situation, the lower border may be at the level of the umbilicus or even below, but the motility is good. No splash obtainable six hours or longer after a full meal. In gastrectasia the splash is usually obtainable six hours or longer after a meal, and in bad cases at any time during the twenty-four hours. Percussion shows enlargement of the organ and delay in emptying itself. In gastroptosis the splash is rather more easily obtainable than in the normal condition and at a lower level, often at the umbilicus or even below it. Percussion shows descent of both upper and lower boundaries, but no enlargement. In pyloroptosis the splash is obtained usually far below the level of the normal lower border. Percussion reveals the peculiar outlines of the vertical stomach with the pyloric end low in the abdominal cavity. In the combined conditions, megalogastrie with gastroptosis, gastroptosis with gastrectasia, and pyloroptosis with dilatation, the signs of the first condition will have added to them the signs of the complicating state of affairs.

Laryngeal Paralysis in Typhoid Fever. (*Annales des Maladies de l'Oreille*, April, 1895.) By W. Lublinski, M.D.

The author has observed five cases of laryngeal lesion in the course of or on the decline of typhoid fever. Four of these cases were observed in the male. The laryngeal troubles have shown themselves after the defervescence in four cases. In the most of the cases nervous lesions are at work. Paralysis of the dilators was observed once, paralysis of one recurrent laryngeal nerve was observed three times, and paralysis of both recurrent

laryngeal nerves was observed once. He concludes that it is certain that our knowledge of this question is not very extensive, and it is impossible to estimate the frequency of this complication in typhoid fever, since systematic laryngoscopic examinations are not made in the course of the disease. —*Revue hebdomadaire de Laryngologie, d'Otologie, et de Rhinologie*, January 4, 1896.

The Nauheim (Schott) Treatment of Heart-Disease. (*Birmingham Medical Review*, December, 1895.) By Robert Saundby, M.D.

The beneficial effects of the Nauheim baths in the treatment of chronic cardiac disease were first proclaimed by the late Professor Beneke, about 1872. A few years afterwards monographs from the pens of Drs. August and Theodor Schott reinforced his teachings, and the treatment gained considerable repute in Germany.

The medicinal waters of Nauheim are derived from twelve springs, of which four are used for drinking and three for the baths. The course begins with a one-per-cent. salt bath at 95° F., and as time goes on the amount of solids may be gradually increased, the temperature lowered to 85.5°, and the time of immersion increased to twenty or thirty minutes. Later on the baths contain the water charged with carbonic acid gas, and, finally, in suitable cases, the "Strombad" with its continuous rush of foaming water is permitted. The immediate effects of the bath are to reduce the rate of the pulse and to increase its force and tension; at the same time the area of cardiac dulness retracts in all directions.

The success obtained by the Zander movement cure induced Dr. A. Schott to devise a system of mild gymnastics for the treatment of neurasthenia and hysterical patients. These exercises were found to slow and steady the heart's action instead of quickening it; and this method, originally devised for steadying the nervous system, proved to be a valuable adjunct to the bath treatment of cardiac disease. The exercises are called "Widerstandsgymnastik," or resistance gymnastics, and consist of slow movements executed by the patient and resisted by the operator, who should oppose with his hand held flatly and so lightly that the patient always feels himself easily the master. These exercises are nineteen in number,—

1. Arms extended in front of body on a level with shoulder, hands meeting; arms carried out until in line, and brought back to original position.

2. Arms hanging at sides, palms forward; arm flexed at elbow until tips of fingers touch shoulder, back to original position; one arm only moved at a time.

3. Arms down, palms forward, arms carried outward and upward until thumbs meet over head; back to original position.

4. Hands in front of abdomen, fingers flexed so that second phalanges touch those of opposite hand; arms raised until hands rest on top of head; back to original position.

5. Arms down, palms against thighs, arms raised in parallel planes as high as possible; back to original position.

6. Trunk flexed on hips; return to original position.

7. Trunk rotated to left, to right; return to original position.

8. Trunk flexed laterally.

9. As No. 1, but fists clinched.

10. As No. 2, but fists clinched.

11. Arms down, palms against thighs, each in turn raised forward and upward until arm is along-side of ear, then turned outward, and arm descends backward.

12. Arms down, palms to thighs, both together moved backward in parallel planes as far as possible without bending the trunk forward.

13. Thighs in turn flexed on trunk, opposite hand resting on chair.

14. Lower extremities in turn extended fully, and bent on trunk forward and backward to extreme limits of movement, opposite hand resting on chair.

15. Legs in turn flexed on thigh, both hands on chair.

16. Feet together, lower extremities in turn abducted as far as possible, and brought back to original position, opposite hand on chair.

17. The arms, extended horizontally outward, are rotated from the shoulder-joint to the extreme limits forward and backward.

18. The hands in turn are extended and flexed on the forearm to extreme limits, and brought back in line with arm.

19. The feet in turn are flexed and extended to extreme limits, and then brought back to their natural position.

The effects of the exercises are the same as those of the baths. The system is claimed by Dr. Schott to be of special value in all cases of chronic heart-disease except where there is advanced degeneration of the myocardium, or aneurism of the heart or great vessels, or advanced arteriosclerosis. It has proved of great service in all forms of valvular disease, in congenital cardiac defects, in simple dilated hearts, in the functional cardiac debility of anæmia, in nervous irritable hearts, in simple tachycardia, and in the rapid heart of Graves's disease.

The theory adopted by Dr. Schott is that the baths and the exercises act upon the heart through the nervous system by evoking a reflex influence which stimulates the action of the cardio-inhibitory or regulator nerves, thus slowing and strengthening the pulse. Dr. Bezly Thorne, who has published an admirable hand-book which explains the system very clearly, believes that the baths and exercises alike favor the circulation by dilating first the muscular arteries and afterwards those of the skin, and thus relieve the heart from backward pressure. The theory of Dr. Thorne is not consistent with the pulse-tracings and manometric observations of Dr. Schott, nor with the physiological law that the heart beats vary inversely with the blood-pressure.

In the writer's opinion the beneficial results of the Schott system

depend upon the very careful and easily regulated method by which the extra work is imposed upon the muscular wall of the heart, which is thereby developed and strengthened by systematic graduated exercises.

Case of Dissecting Aneurism of the Aorta; Rupture into the Pericardium. (*British Medical Journal*, February 15, 1896.) By H. S. Elworthy, M.D.

The case had suffered from abdominal pains of obscure causation for some time. He suddenly began to complain of severe pain in the abdomen, shooting into the throat and arms. There was numbness of the arms, paralysis of the legs, and collapse; death occurred twelve hours after the onset of the acute symptoms. The autopsy showed transverse rupture of the inner and middle coats of the ascending aorta. The external coat was dissected as far as an inch into the left external iliac, the lumen of the aorta itself being almost obliterated by pressure. The external coat had ruptured by a vertical slit into the pericardium. No clinical history of the symptoms presented by the heart is given, nor was the real condition suspected.

Affections of the Skin occurring in the Course of Bright's Disease. (*British Medical Journal*, November 30, 1895.) By P. H. Pye Smith, M.D.

Besides erythema læve, four forms of affections of the skin, occurring in Bright's disease, are described,—

1. A bright-red, diffuse papular eruption, similar to that caused by sweating, but without sudamina.

2. A papular eruption, with large discrete, rather dark-red pimples seated on a dry, rough, and sometimes scaly skin.

3. A moist dermatitis, occurring on the legs and arms, but not affecting the flexures of the joints, and without irritation.

4. An extensive and diffuse dermatitis resembling dermatitis exfoliativa.

All these are superficial, leaving no trace after death. They are never pustular, rarely purpuric, and they are associated with slight, if any, subjective symptoms. Usually they appear late in the course of the disease, but they do not indicate any aggravation of the renal symptoms. The author does not believe that the renal disease has a more direct causal connection than that it exerts in the production of the more common inflammatory conditions of the serous membranes.

Two Cases of Chromidrosis. (*Lancet*, February 15, 1896.) By F. W. A. Scott, M.D.

The patients, father and son, working in the same place, noticed that their linen was stained a pink color, more marked where it came in contact with the neck, wrists, and scrotum. The skin itself was apparently perfectly normal. Cultures, however, developed a pink growth, and the organism was found to be a torula. The author believes that some peculiar condition of the skin is necessary for its development.

The Question of Leucocytosis in Tuberculous Processes. (*Deutsche Archiv für klinische Medicin*, vol. lvi., Nos. 3 and 4, 1895.) Stein and Erbmann.

Having first reviewed briefly the literature and shown the very contradictory opinions held by different authorities, the authors describe a modification of the latest method suggested by Thoma for the estimation of the number of leucocytes. This method is admirable and deserves to be given *in extenso*. The slide having been prepared in the usual manner and focussed under the microscope, the draw-tube is moved up and down, until the edges of the field of vision exactly include a square of a definite side length = s . Then the area of the square is to the area of the circle as $S^2:r^2 \times \pi$; or as $2r^2 = S^2$, then the ratio is $S^2:\frac{S^2 \times \pi}{2}$, or $2:\pi$. The area of the included square, therefore, equals $\frac{2}{\pi}$ times the area of the circle.

If this contain a unit of small squares, then each of these equals $\frac{1}{a}$ part of the large square, and the area of the circle in these units equals $\frac{2}{\pi \times a}$. It

requires four thousand of these to contain one cubic millimetre of liquid, therefore, to estimate the number of corpuscles in this body of liquid, Z the number counted must be multiplied by twice four thousand times the dilution (d) and divided by $\pi \times a$ times the number of fields counted (m), or $x = \frac{Z \times 2 \times 4000 \times d}{\pi \times a \times m}$. A dilution of 1:10 is recommended, and the

counting of twenty-five fields giving a constant formula $\frac{Z \times 80,000}{\pi \times a \times 25}$, or $\frac{Z \times 3200}{\pi \times a}$. Tables are now given for fields containing twenty-five, thirty-

six, and sixty-four small squares. The use of tables is, of course, a disadvantage at first, but even without them the calculation is but slightly more complicated than that of the ordinary method, and the fact that all the corpuscles in a field are counted without regard to the lines, after the field has been set, is a great relief to the eyes.

By this method, making several mixes from each case for greater accuracy, a number of cases were examined, and from the results obtained certain conclusions drawn. The counts were always made at 11 A.M., four and a half hours after the ingestion of food. In ten cases of commencing tuberculosis the number of leucocytes was normal, ranging from two thousand five hundred to nine thousand. In ten cases of advanced pulmonary tuberculosis without the formation of cavities or extension beyond the apices the result was the same. In five of seven cases of hæmoptysis, a leucocytosis ranging from twelve thousand to twenty thousand existed during or immediately after the hemorrhages. In two, despite severe hæmoptysis, the white blood cells were not increased. There now follows a tabulation

of forty cases in which the tuberculous process was either advanced or increased very considerably during the observation. The results of the autopsies are recorded in a number of the cases.

The authors now consider the results of their investigations, and conclude that the leucocytosis occurring after hæmoptysis cannot be distinguished from ordinary post-hæmorrhagic leucocytosis. This, they believe, is due to the stimulation of the lymphatic glands by anæmia, and urge in confirmation of their theory the fact that the leucocytes were chiefly large (?) and small lymphocytes. They also call attention to what they call the peculiar functional activity in the lymphatic system in tuberculosis.

The forty tabulated cases are now critically considered. Of these, five presented slight, if any, increase in the number of leucocytes; all were cases of chronic pulmonary tuberculosis, extremely emaciated, with fatty degeneration of the organs, and either no cavities or very small ones. Thirteen cases had moderate leucocytosis, reaching twenty thousand. In these there were few or no cavities, but usually other conditions existed, such as anæmia, lymphadenitis, pleurisy, or pneumothorax, sufficient of itself to account for the increase in the number of white blood cells. A number of cases of rapid development with large cavities, or tuberculosis of other organs, had a marked leucocytosis, reaching from thirty thousand to sixty thousand. One case had fibro-purulent peritonitis, another caries of the vertebræ, and in others other secondary conditions existed.

From this analysis they conclude that leucocytosis occurs under the following conditions:

1. When extensive cavities exist.
2. During inflammatory processes occurring just before death.
3. In chronic suppuration resulting from carious processes.
4. In hyperplasia of the lymphatic glands, even when the pulmonary process has not led to extensive destruction of tissue.

The possibility that the leucocytosis is due to infection by staphylococci or streptococci is discussed, and the virulence of many of the forms found in phthisical lungs offered as an argument in favor of this view; but as the investigations showed that when, in a case with cavities, the process ceased to advance, the number of leucocytes diminished, and when the destruction of lung-tissue was rapid, it increased, the authors conclude that "the leucocytosis is not merely the result of a mixed infection, but corresponds to a secondary infection proceeding from the cavities, and to a chronic septicæmic fever."

Destruction of tissue, therefore, is the immediate cause of leucocytosis, as thereby pus cells and leucocytes are absorbed into the blood channels, and increase of the number of the white elements occurs.

And further that the number of leucocytes is normal,—

1. In beginning phthisis.
2. In advanced cases limited to the apices or, at least, without cavities.

3. In cases of chronic infiltrating tuberculosis with little or no destruction.

4. And that it is slightly increased after hæmoptysis.

The inferences to be drawn clinically are,—

(a) Increase of the number of leucocytes in cases in which no suppurative or exudative process exists is evidence of destructive action.

(b) A sudden increase indicates the beginning of a distinctive process.

(c) A normal number of leucocytes excludes cavity or destructive process.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

Mortality from Diphtheria since the Use of Serum. (*Progrès Médical*, December 21, 1895.) By M. H. Monod, M.D.

In one hundred and eight towns in France, comprising more than twenty thousand inhabitants, the mean mortality from diphtheria during the first six months of the years 1888 to 1894 was two thousand six hundred and twenty-seven. During the first six months of 1895 there have only been nine hundred and four deaths, a decrease of 65.6 per cent. If one considers that diphtheria is more frequent in the country than in the towns, one ought to consider at least fifteen thousand lives saved each year.

The Action of Alcohol on Digestion. (*Progrès Médical*, December 21, 1895.) By M. P. Haan, M.D.

The author presented the results of his experimental research on this subject to the *Société de Biologie*. He concludes that in small doses alcohol stimulates the stomach, and consequently promotes hyperchlorhydria and hyperacidity of that organ. In large doses it loses its stimulant action, and the chlorhydric action upon albuminoids is either weak or wanting.

Treatment of Diabetes by the Ingestion of Pancreas. (*Wiener medicinische Blätter*, 1895.) By M. Borman, M.D.

The author reports the case of a man, aged thirty, who came to the hospital complaining of general weakness, polyuria, various pains, cough, etc. He had the appearance of a consumptive, but tubercle bacilli could not be found in the expectoration. He voided three thousand five hundred grammes of urine, which contained a high proportion of sugar (dextrose): four hundred grammes in twenty-four hours. The case was of the type of wasting diabetes, and the glycosuria had been present a long time, as was proved by an old furunculosis and troubles of vision. Under the influence

of appropriate diet the polyuria and glycosuria improved; the daily quantity of sugar fluctuating between thirty and one hundred and ten grammes; the weight was not much changed.

About the 5th of April the patient was given one roasted ox-pancreas. The sugar fluctuated between seventeen and forty grammes. After a time the patient refused to continue this food. Then, in experimenting with the gland, he took the juice of a half pancreas by the stomach-tube; the sugar fell to fourteen grammes, but increased shortly to thirty grammes, at which figure it remained until about the 20th of April, when the patient was given a daily injection of one centimetre and a half of extract of pancreas. The patient left the hospital May 9, considering himself very much improved; and, in fact, he was really stronger. He suffered less from thirst and his polyuria was less. Finally, during his stay at the hospital he had increased more than four kilogrammes in weight.—*Gazette Médicale de Liège*, January 9, 1896.

A Case of Tetanus, following Abortion, treated by Antitoxin; Recovery. (*Boston Medical and Surgical Journal*, January 16, 1896.) By Charles T. Withington, M.D., of Boston.

The author reports a case of tetanus following abortion which was claimed to be non-instrumental. Three days after the abortion there were signs of puerperal sepsis and the uterus was curetted, and three days later symptoms of tetanus appeared.

The patient had frequently recurring spasms, averaging from ten to twenty an hour. She was treated at first by large doses of bromide of sodium and chloral, and later with tetanus antitoxin-serum. She received, on three successive days, twenty-two cubic centimetres, twenty-three cubic centimetres, and twenty-three cubic centimetres respectively. This treatment relieved the spasms, the occurrence of the spasmodic movements falling from one hundred and twenty in nine hours to thirty-five in eleven hours. The bromides and chloral were reduced in amount when the first injection of serum was given, and discontinued entirely at the time of administering the third dose. Three days after the third administration of the serum the spasms were on the increase, and the patient received a fourth injection of twenty-two cubic centimetres of serum. Improvement was then constant, and the patient was discharged cured in about two months' time, menstruation being established before she left the hospital. At the time of the fourth dose of the serum the patient was given a single dose of fifteen grains of chloral.

Some New Drugs.—Apocodeinum Hydrochloricum, Arecolinum Hydrobromicum, Argentamin, Argonin, Bismuthum Betanaphtholicum, Bryonine, Calcium Permanganicum, Magnesium Permanganicum, Calcium Sulphophenylicum, Calcium Sulphuratum, Canadinum Hydrochloricum. (Collected largely from *Merk's Berichte* and abstracted in the *Therapeutische Wochenschrift*, February 16, 1896.)

Apocodeinum Hydrochloricum.—Different opinions prevail in regard to the pharmacodynamic effect of apocodeine, and persist to-day, in spite of two researches of recent date. While Murrel attributes to the drug a purely expectorating effect, Guinard is of the opinion that apocodeine acts principally as a sedative, but increases at the same time the salivary secretion and the peristalsis of the bowels. G. Meder, in his recent essay ("Inaugural Dissertation," Dorpat, 1895), supports Murrel's view, and asserts emphatically that apocodeine has practically only the value of an expectorant. On the contrary, Toy's (*Therapeutische Wochenschrift*, 1895, p. 875) reports agree with Guinard's researches, in that the application of this medicament in maniacal conditions is always followed by tranquillity and ease of mind, sometimes by a sleep of several hours' duration. The administration *per os*, as well as by subcutaneous injection, gives rise to intestinal peristalsis, and produces always one and sometimes even two to three evacuations. The sedative dose is from two to six centigrammes, whether given subcutaneously or internally.

For internal administration :

R Apocodeini hydrochlorici, 0.5 ;
 Aquæ destillatæ, 100 ;
 Syrupi rubi idæi, 25. M.

Sig.—One-half to one teaspoonful at a dose.

Or subcutaneously :

R Apocodeini hydrochlorici, 0.2 ;
 Aquæ destillatæ, 10. M.

Sig.—One Pravaz syringe-ful at a dose.

Arecolinum Hydrobromicum.—New experiments with arecolinum seem to indicate that we have gained in this drug a substitute for physostigmine. After Fröhner and others had recommended the utilization of the sialagogic and laxative action of arecoline for its laxative effect in the constipative colic of horses, Lavigna, of Turin, employed the alkaloid as a myotic. Instillation of a drop of a one-per-cent. solution of the arecolinum hydrobromicum is recommended. A well-marked myosis occurs in five minutes, which reaches its maximum after ten minutes, and persists for thirty minutes. After seventy minutes the pupil is reduced again to its normal size. The maximum myosis obtainable by arecolinum* is found in a pupil-diameter of one and a half millimetres. The repeated application of this remedy in the above-mentioned dose, within a day's time, never produces headache. Lavigna therefore believes arecolinum is a myotic well worth consideration, as its effect is very rapid ; and, on the other hand, it produces well-pronounced dilatation of the pupil that does not persist over an uncontrollable time.

The following solution commends itself in ophthalmological practice :

R Arecolini hydrobromici, 0.1;

Aquæ destillatæ, 10. M.

Sig.—Eye-drops for producing myosis.

Regarding the physiological effects of arecoline, Battistini and Scofone have recently made researches, and have proved that in frogs it produces first an exaggeration of the reflexes and spasms, and, after very large doses, paralysis. In the warm-blooded animals myosis, salivation, diarrhœa, paralysis of the heart and of the respiration set in. Arecolinum produces diastolic arrest in frogs, which may be removed by the administration of atropine. The curve of contraction of the muscles is not essentially changed, but the curve of fatigue shows a well-marked increase of the exertion of the muscles. The application of arecolinum as a tænistifuge in place of arcanis-nut was recommended by Bardet at a meeting of the Parisian Therapeutic Society held October 23 of last year. Pouget replied that its disagreeable effect upon the heart in animals might limit its application in man. If its accompanying effects are really to be ascribed to arecolinum, and not to impurities of the drug, it would be advisable to consider if the less poisonous ethyl ether of arecaine, which is termed homarecolin ($C_7H_{10}(C_2H_5)NO_2$), should not be employed in its stead.

Argentamin.—The gonococci-destroying effects of argentamin observed by Schäffer were verified in the course of the past year by the examinations of A. Aschner (*Therapeutische Wochenschrift*, 1895, p. 464) and of Albertazzi. Aschner recommends that injection of the whole urethra be made with a solution in the strength of 1 : 1000 and 1 : 250. For anterior urethra, which is more sensitive, solutions of 1 : 2000 and 1 : 1000 are recommended. Both experimenters agree in praising the penetrating effect of this drug, on account of which the remedy is more able to reach and kill the gonococci hidden in the folds of the mucous membrane than any of the usual antigonorrhœics. The first days of the treatment, especially after the use of the concentrated solutions, the gonorrhœal discharge is somewhat increased, but decreases rapidly in the course of a few days.

R Argentamini, 0.05–0.1 or 0.2–0.4;

Aquæ destillatæ, 100.

Sig.—For injection.

Argonin.—This drug is produced by chemical replacement of sodium casein with argentum nitricum. The resulting casein-silver combination, which is soluble in warm water, forms in a dry condition a colorless powder. In order to dissolve argonin, one moistens carefully the minute particles of the substance, in a mortar or in an evaporation dish, with cold water, until it is fully moistened. Then it is put into a water-bath and heated and stirred until the solution is complete. Insoluble portions are removed by filtration. Argonin solutions, which may be prepared up to the strength of ten per cent., do not keep very long, and must be kept well protected against light. Fifteen grammes of argonin contain as much silver

as one gramme of silver nitrate. The researches of A. Liebrecht, R. Meyer, and J. Jadassohn have revealed that argonin as well as silver nitrate has antibacterial qualities, but is distinguished from the latter drug by its non-caustic effect. The disinfective power of the remedy shows itself especially against the gonococci. If argonin is mixed with ammonia by an attenuation of 1 part of argonin to 30,000 parts of nutrient agar, the growth of the gonococci is stopped after five minutes. A solution of one to two per cent. of argonin was tried by Jadassohn in the treatment of acute gonorrhœa of the anterior and posterior urethra of a man, and the urethra and uterus of a woman, with the best results. As the preparation does not seem to have astringent qualities, it is advisable to use other remedies in treating catarrhal affections.

R Argonini, 1.5-2;
Solve lege artis in aquæ destillatæ, 100;
Detur ad vitrum nigrum.
Sig.—For injection.

Bismuth Betanaphtholicum.—According to H. Engell, betanaphthol bismuth, which was recommended by Schubenko and Jasenski as a disinfectant of the bowels, is indeed a reliable remedy in all more or less intense alterations of the functions of the intestinal canal, surpassing all other known bismuth preparations. Its administration is especially indicated if the assumption of auto-intoxication from the bowels is tenable. Betanaphthol bismuth may be given without danger for a long time, even to children, in doses of 0.25 to 0.5 gramme three times daily. In adults this amount is doubled.

R Bismuthi betanaphtholici, 3;
Pulv. gum. arab., 0.5;
Mucilag. g. arab., q. s.
Misce f. mass. pil. No. 30.
Obduc lege artis salolo.

Sig.—Two to five pills three times daily. (To be used in acute intestinal catarrh.)

R Bismuthi betanaphtholici, 0.3;
Da ad chartam japonicam tales.
Doses No. 20.

Sig.—One powder three times daily in catarrh of the stomach. It is best to give children in the above-mentioned prescription 0.03 gramme for every year of life, as recommended by Chaumier.

Bryonine ($C_{18}H_{80}O_9$).—Bryonine is found with bryonidine in radix bryoniæ albæ. It is a glucoside and forms a yellow, very bitter-tasting amorphous powder, which is easily soluble in water and alcohol. To prevent decomposition it is necessary to preserve the preparation in a dry place, well corked. According to the researches of J. M. Shaller, bryonine has an irritating effect upon the mucous membrane of the stomach. In a sufficiently large dose bryonine is a very efficient cathartic, and also exer-

cises some influence upon the activity of the kidneys, increasing the amount of urine voided. Its administration is therefore indicated in all cases of dropsy and in congestive conditions of the liver. It also has a beneficial effect in annoying conditions of some other diseases, as in headache after meningitis, pains in the side after pleurisy, in præcordial attacks of pericarditis, and in pains of chronic articular rheumatism. Bryonine is especially indicated in all chronic inflammatory conditions of the serous membranes. Bryonine is best prescribed in the form of granules, each of which contains one milligramme of the drug. One granule is given every two hours until sufficient evacuation of the bowels is obtained, while later on one granule twice or three times a day is sufficient. In vigorous patients suffering from habitual constipation these doses may be increased in the ratio of one to two granules a dose. In a weak patient the dose should be proportionately decreased.

R Bryonini, 0.1;
 Sacchari lactis, 4;
 Gummi arabici, 1;
 Syrupi simplic. q. s. ut f. massa e qua formentur granula No. 100.
 Sig.—One granule every two hours.

Calcium Permanganicum, $\text{Ca}(\text{MnO}_4)_2 + 5\text{H}_2\text{O}$.—Calcium permanganicum resembles in its appearance potassium permanganate. It is, however, less distinctly crystalline. In water it is very easily soluble. According to Bordas (Parisian Academy of Medicine, June 26, 1895), we are likely to possess in this remedy an ideal antiseptic, surpassing even the bichloride of mercury. As further advantages of the permanganate are to be mentioned the fact of the absence of toxic or caustic effect. The calcium permanganicum has a hundred times stronger antiseptic effect than the potassium salt, because the drug is decomposed when brought in contact with organic matter, even in the cold, the final products being oxygen, manganese oxide, and calcium oxide. For this reason Bordas and Girard recommend calcium permanganate in place of the potassium salt for the purification of drinking water. In order to remove the surplus of calcium permanganate and to discolor the water, the lower oxides of manganese are supplied, in order to reduce the permanganate and transform it into manganese dioxide. The water treated with calcium permanganate is free from organic matter and micro-organisms, and contains, along with a small amount of carbonate, traces of oxygenated water, which again help to keep the water free from contamination. Experiments to utilize the antiseptic power of calcium permanganicum in practical medicine have been already begun, and when completed may give satisfactory results.

Magnesium Permanganicum.—Merek has prepared in the course of the past year, while investigating the soluble permanganate preparations, magnesium permanganicum, $\text{Mg}(\text{MnO}_4)_3 + 6\text{H}_2\text{O}$, which very likely might have the same oxidizing power as the corresponding calcium salt.

It consists of granular bluish-black crystals which are easily soluble in water.

Calcium Sulphophenylicum, $\text{Ca}(\text{C}_6\text{H}_5\text{SO}_4)_2$.—This is a white, astringent, bitter-tasting powder, nearly odorless, soluble in water and alcohol. G. Tarozzi in the past year called attention to the application of magnesium sulphophenylicum, and also recommends the calcium salt as an excellent antiseptic and astringent in all cases in which a cicatricial union of certain external or internal lesions is desired. The remedy is given in the following formula :

R Calcii sulphophenylici, 2;
Aquæ destillatæ, 150;
Syrupi rubi idæi, 50.

Sig.—One teaspoonful every two or three hours.

Calcium Sulphuratum, CaS .—This drug is a grayish-white powder. W. E. Green observed that all of his patients who had taken this drug have been immune from influenza, and he therefore believes that the preparation is a prophylactic against this disease. The immunity is established after three days' use of a dose of 0.06 gramme of the remedy. Quinine sulphate has a much less energetic prophylactic action than calcium sulphide; but a dose of 0.3 gramme of the former preparation is more efficacious if the influenza has already set in.

R Calcii sulphurati, 2;
Terræ siliceæ, 0.3;
Mucilag. g. tragacanth., q. s. ut f. pil. No. 30.
Obduc solution e gum. sandaracæ.
Dentur ad vitrum.

Sig.—Several pills to be taken on an empty stomach daily.

Canadinum Hydrochloricum, $(\text{C}_{20}\text{H}_{21}\text{NO}_4\text{HCl})$.—This drug appears in small colorless crystals, which become yellow in time, and are soluble with difficulty in water. The alkaloid canadine is found along with berberine and hydrastine in the root of the *hydrastis canadensis*. Large doses of canadine produce in warm-blooded animals psychic and motor signs of irritation, which last a short time, and are followed by cerebral and spinal paralysis (von Bunge). Canadine, furthermore, produces intense peristaltic movements of the bowels and diarrhœa. The drug does not exercise any influence upon the uterus, but has a poisonous effect upon the fœtus, which is irritated to violent movements, while at the same time the uterus is motionless. Blood-pressure is not affected by canadine as it is by hydrastine. Canadine, therefore, does not share the healing properties of hydrastis extract in hemorrhages of the uterus. Small doses do not affect the heart in a typical way; large doses produce arrhythm. A fatal dose for cats, if inoculated by intravenous injection, is 0.2 to 0.25 gramme per kilo of the body-weight. Death occurs through paralysis of the respiratory centre. The smaller portion of the canadine leaves the body through the intestine

unchanged ; the larger part becomes disintegrated in the organism, one of the final products, oxalic acid, being excreted with the urine.

Acetanilid-Poisoning in Babes due to its External Application. (*Journal of the American Medical Association*, February 1, 1896.)—Charles W. Rook, M.D., of Quincy, Ill., has had recently two cases in new-born infants of acetanilid-poisoning, one terminating fatally, from the use of acetanilid as a dusting powder. In a case of erythematous inflammation of the skin of the nates, thighs, and groins, a powder composed of equal parts of subnitrate of bismuth and acetanilid was dusted upon the inflamed areas of a babe four days old, three or four times during the afternoon and night. On the following morning the babe was found deeply cyanosed, and died a few hours later. From a single application to a babe two days old deep cyanosis followed. Twenty-four hours later it had fully recovered from the toxic effects.

Some Unusual Forms of Scabies, with an Account of the Treatment of the Disease. (*Liverpool Medico-Chirurgical Journal*, January, 1896.) By Leslie Roberts, M.D., of Liverpool.

The symptoms of scabies fall into two groups: (1) those symptoms due to mechanical movements and life of the acari in the epidermis; and (2) those resulting from the reflex irritation of the spinal cord. After showing that the burrow may be preceded by other lesions due to reflex spinal excitement and scratching, the author cites a number of interesting cases, such as those of acarophoria, which occurs in persons who have recently recovered from an attack of scabies, and of acarophobia, when the patient suffers from a delusive form of cerebral pruritus, who has never been the subject of acariasis. It is stated that scabies may be derived from the horse, and when so contracted is capable of being cured more readily than when contracted from man, as the acarus of the horse is not in the habit of burrowing deeply.

Roberts then points out that success in the management of the disease depends very largely upon the clear recognition of the duality of its symptoms. The primary and mechanical lesions of acariasis can indicate but one line of treatment,—namely, the destruction of the acari and their ova. But our conduct towards the nervous group of symptoms must be guided by the conditions of the case. If the symptoms of inflammation are not too acute we may begin straightway with the means of destroying the acari. In his own practice, the writer follows the French custom of soaping the body of the person, and keeping him for half an hour in a warm bath. The part which acari are known to infest are well scrubbed (if there are no acute inflammatory symptoms) with a nail-brush, with the intention of breaking down the walls of the burrows. When this procedure has been satisfactorily carried out, the patient leaves the bath, is dried, and then well rubbed over with the antiseptic ointment. On the following morning

and evening the inunction is repeated, but not the bath; on the second morning and evening inunction is again repeated, and again on the morning of the third day. On the evening of the third day the patient takes to the bath for the second time, and the skin is cleansed from the ointment. If the first bath has been efficient, it will not be necessary to make use of the nail-brush. But now comes the crux where so many practitioners go wrong, by not clearly comprehending the duality of the disease. For the first three days our attention has been given exclusively to the killing of the acari, at the end of which time there should not be a living acarus on the body.

When the three days' slaughter has been accomplished, we have to face a problem of another sort,—namely, the treatment of the nervous and toxic symptoms. Now, our dealings with these symptoms must be conducted in a very different manner from that of the killing process. Our object now is to calm and heal the disorder. We are in reality no longer treating scabies, but eczema or a dermatitis. The exact line of treatment to follow will be indicated by the conditions of each individual case. Such, in outline, are the lines on which the treatment of every case of scabies should be conducted. Of course, there will be cases that will call for special judgment. Thus, in certain cases, the killing process will have to be suspended until the toxic or nervous symptoms have abated under soothing treatment. In Vienna a rather different process is followed to that just related, but the principle is the same in both. There they take advantage of the fact that the acari are entirely dependent upon the presence of moisture in the skin, and generally die if their water-supply is removed. Kaposi, therefore, follows the *dry method*. The patient is not bathed, but smeared over with a saponaceous ointment, containing naphthol and chalk, and then the whole surface of the limbs and body is sprinkled with starch-powder. This procedure is repeated twice daily for a fortnight, at the end of which period the patient takes a warm bath, and is cured.

For Insomnia due to Noise. (*Practitioner*, February, 1896.)—For those whose rest is disturbed by the noises of the street, by the howling of dogs, by the crowing of cocks, the cooing of doves, and the various sounds which murder sleep in town or country, the following plan may be commended: Professor O. Rosenbach, of Breslau, suggests plugs of cotton-wool steeped in vaseline, each six centimetres long, three centimetres wide, and one centimetre thick. The upper surface of the plug is smeared with vaseline, then rolled into the form of a cylinder and put into the auditory meatus to a depth of about two centimetres. The outer end is spread out in the concha, and outside this a layer of wool is applied. The plug is taken out in the morning, when the meatus must be well dried. Dry cotton-wool does not prevent the sonorous vibrations from reaching the tympanic membrane, but plugs greased in the manner just described do so effectually, though, of course, they do not prevent mechanical shaking.

The Present Position of Treatment with Organ Extracts. (*Therapeutische Wochenschrift*, iii., 4, 1896.) By Professor Fr. Kraus, of Gratz.

After discussing the history of this treatment, and then the functions of the thyroid gland, the author states that the symptoms of cachexia thyreoidea are those of a toxic influence governed by nervous disturbances, such as tetany, pareses, anæsthesias, and psychical disturbances. Death is caused by respiratory failure due to bulbar paralysis. Other changes are diminished blood-pressure, diminished number and resisting power of the erythrocytes, decreased amount of oxygen in the arterial blood, increased frequency of respiration, difficulty in swallowing, vomiting, glycosuria, impaired sexual power, menstrual disturbances, and imperfect development of the skeleton. Horsley recognizes three types,—neurotic, myxœdematous, and cachectic. All these morbid conditions can be cured by the introduction of thyroid substance into the body.

Given to healthy persons it causes loss of weight and diuresis. Occasionally large doses produce symptoms similar to those of Graves's disease. One doubtful case of death is reported.

The following conditions have been suggested as indicating the use of thyroid extract: 1, spontaneous and congenital myxœdema; 2, cachexia and tetania thyreopriva; 3, tetany; 4, struma parenchymatosa; 5, acromegalia; 6, exophthalmic goitre; 7, obesity; 8, certain skin-diseases (psoriasis, lupus, eczema); 9, new growths, such as syphilis, leprosy, tuberculosis, carcinoma; 10, mental diseases and epilepsy.

For myxœdema, as the study of about one hundred and fifty cases shows, thyroid extract is almost a specific; where mental disturbances coexist, if dependent upon the myxœdema, they are also benefited. In tetany, however, in spite of its close relation to myxœdema, the results have been negative. Exophthalmic goitre would not seem to be adapted to this treatment, if the theory of Möbius that it is due to excessive action of the gland be true, nevertheless, the clinical results are not wholly unfavorable. Of twenty cases, ten were not affected, several made worse, and a few cured. Kraus himself has given the extract to three cases, of which one, a mild, recent case, was cured, one made worse, and one unaffected. In acromegalia certain doubtful results have been obtained. More successful have been the experiments in goitre. In young individuals the parenchymatous form seems to react promptly and well. Bruns, Ewald, and Miculicz have reported a number of successful or partially successful cases.

Kraus strongly disapproves of the use of thyroid extract in mental disorders and epilepsy, although some good results have been reported, and is equally emphatic concerning skin-diseases. He bases his opinion upon the extreme doubtfulness of the results and the absence of a scientific basis for the treatment. Menzier has reported very excellent results in malignant syphilis. Kraus has made a number of experiments upon tuberculous patients, but entirely without result.

In corpulency, particularly that of old people with some anæmia, the

results have been excellent. No change is made in the diet, and the treatment is, therefore, always acceptable. Certain symptoms of thyroidism, as tachycardia, are to be avoided.

The medicatio pancreatica has apparently a good physiological basis, as animals in which pieces of pancreas have been implanted resist exceedingly well pancreatectomy. Nevertheless, no good results have been reported in cases of glycosuria, nor has the author himself been at all successful. The effect of suprarenal feeding upon Addison's disease has been only to increase the diuresis. The following conditions are given as indicating the injection of testicular fluid: Senility, debility, and such nervous diseases as tabes dorsalis, neurasthenia, epilepsy, chorea, paralysis agitans, and mental disorders. The author has obtained excellent results in cerebral neurasthenia. [Dr. Osler reported in the February number of this magazine a case that was treated with marked benefit with extract of the suprarenal bodies.—J. S.]

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D., AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the
University of Pennsylvania,

Medical Superintendent of the Presbyterian
Hospital.

Tuberculosis of the Hip-Joint. (*International Clinics*, January, 1896.)

By John Ashhurst, Jr., M.D.

The large majority of cases of hip-disease have as their essential lesion the existence of tuberculosis in some of the tissues about the joint, and superadded, in many cases, to the previous existence of the tubercle bacilli in some part of the body is a slight traumatism which seems to determine the locality in which the disease shall be developed. Modern pathologists believe that the tubercle bacilli may be stored up in some part of the body, probably in the bronchial glands, and a place of less resistance being developed in some of the tissues as a result of slight rather than of severe bruises, the tubercle establishes itself at that point and goes on to the production of hip-disease.

The lesions of tuberculous hip-disease may begin in any one of the constituent parts of the joint. Tuberculosis may exist first in the head of the bone, or in the neck, the consequent destruction of which sometimes leads to separation of the head, which remains as a sequestrum in the articular cavity; or, again, in rare cases the disease begins in the acetabulum; it may also make its first appearance in the soft tissues, and especially in the ligamentum teres. The function of the ligamentum teres as explaining

the circumstances under which it may become involved in hip-disease, and explanations for the very marked changes observed in the head and neck of the femur are points of especial interest.

Bone changes may be most prominent in the neck, it being partially or quite absorbed, or in the head which may be reduced to a mere osseous button. The changes in the head of the bone are due to a combination of three causes: (1) the presence of tubercle; (2) the attrition of the head of the bone against the acetabulum; and (3) the maceration of the bone in the purulent contents of the joint. As regards the changes in the neck of the bone, we have a very interesting alteration in the shape of the neck and in the angle which it makes with the femur. The head of the bone in the normal position occupies a position considerably above the level of the trochanter, and the neck joins the shaft at an angle of about one hundred and forty degrees, varying somewhat at different periods of life, but always making an obtuse angle with the shaft. In some cases of hip-disease the neck is shortened and the angle of its attachment reduced to about one hundred and thirty degrees; or the head is separated from the neck, which occupies a position at right angles to the shaft; or the head and neck may both almost entirely disappear, the neck being at right angles to the shaft. This striking change in the neck of the bone is due to a rarefying osteitis, which is not necessarily a tuberculous lesion. It is spoken of as a senile change because it is found in old persons; but Sir George Humphrey, of Cambridge, England, has demonstrated by comparative observations in persons who had been subjected in early life to amputation of one of the lower limbs, that this change is not dependent upon old age, but is a result of pressure. A rarefying osteitis by softening the bone may produce the so-called senile change in a few months, and the angle of the neck of the bone may be so changed that the trochanter slips as it were beyond the head, which still remains in its socket.

Most surgeons are under the impression that the ligamentum teres has no function, but it really has an important one. It may be described as a suspensory ligament of the trunk. When the patient is erect it is almost a vertical ligament. The weight of the body is sustained mostly by the head of the femur in more or less contact with the cotyloid cavity; but these ligaments serve to diminish the pressure of the pelvis upon the head of the bone, and to lessen strain. They also prevent sudden concussion, which would otherwise be experienced at every step we take. As a result of stress put on the ligament in the various movements of the part it becomes weakened, and thus a place of less resistance is made in which a deposit of tubercle follows; the ligament, softened and partially disintegrated, ceases to protect the joint, the other constituents of which then suffer from the effects of concussion and other slight traumatism, and in turn become tuberculous. The primary lesion of the ligamentum teres thus furnishes a prolific cause of hip-disease.

The following typical case of coxalgia shows apparent cure after nine-



A case of cured coxalgia, with the diseased limb in a position of flexion, nine months after treatment was begun.

months: Edna K., aged nine years, complained of pain in her left knee in February, 1895. In April she began to be lame and the slightest motion of the left hip caused pain. A diagnosis of incipient coxalgia was made. The patient was admitted to the Methodist Episcopal Hospital, and there remained in bed for four months with sand-bags on either side of the left leg and an extension of four pounds in weight. A plaster-of-Paris dressing was then applied, and she was allowed to get about with a high shoe on the sound leg and crutches. There was now slight pain on free motion, especially when the knee was flexed on the abdomen. In November, eight months after treatment was begun, there was very slight fixation on extreme flexion, and no pain whatever. This is well shown in the plate, in which the child may be seen standing on her right foot, with the left one elevated in such a way as to bring the knee on the affected side almost up to the abdominal wall.

It is probable that in this case the disease was arrested promptly by the treatment instituted, and if so, it is probable that the disease was limited to the articular cartilage of the head of the bone, and the inflammatory process arrested before the development of any rarefying osteitis.

Treatment of the Sac in Hernia. (*Annals of Surgery*, January, 1896.)
By Gwilym G. Davis, M.D.

The author describes a new method of treating the sac, suitable for both inguinal and femoral hernias. The sac having been opened, its contents

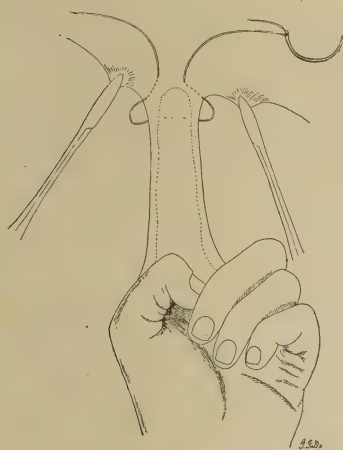


FIGURE I.

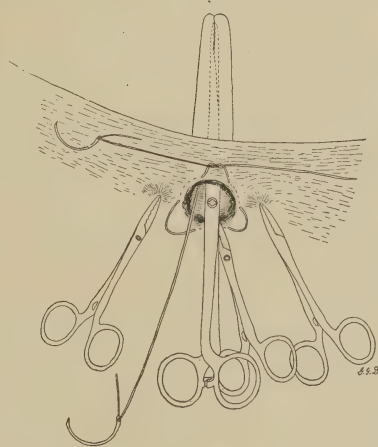


FIGURE 11.



FIGURE 111.

are returned to the abdomen. The left index finger is then introduced until its tip reaches the neck of the sac, the remainder being grasped by the thumb and other fingers (Fig. 1). Three hæmostatic forceps are attached to

the abdominal continuation of the sac, a short distance away from the finger, one is on each side and one behind. A curved needle threaded with silk-worm-gut, or other substance, is passed in and out three times, encircling the neck of the sac, carefully avoiding the larger vessels. Only half the circumference is included, because as each stitch emerges it skips as much as was included in the previous one. (See Fig. 1.) The finger is now withdrawn and the intestines prevented from descending by pressure made by an assistant. Four inches only of the sac is retained, the remainder being cut off. The retention of a greater amount causes liability to sloughing. The distal end of the sac is then transfixed with a catgut thread, which is left hanging. The end of the sac being grasped by a long forceps, it is inverted (Fig. 2), like the finger of a glove, its full length into the abdominal cavity.

An assistant now ties the ligature and the three hæmostatic forceps are removed. The catgut hanging out is now seized and pulled taut, thus folding the sac on itself, as in Fig. 3: it is fastened by stitching through the adjoining tissues. The ends of the purse-string ligature around the neck of the sac are then threaded on needles and brought up through and tied on the upper surface of the muscles. The gap in the walls is closed by Bassini's, Halsted's, or other plan. This method fixes a pad on the inner side of the peritoneum. Its agglutination is favored by scraping the interior of the sac with a curette before inverting. The method is also applicable to femoral hernia, and it is suggested that a chip be chiselled from the pubic bone to help block the femoral canal.

Movable Kidney. (*Annales des Maladies des Organes Génito-Uri-naires*, July, 1895.) By M. Albarsan, M.D.

After discussing at length the symptomatology and pathology of this condition, the author discusses carefully the different modes of treatment and the particular cases to which they are adaptable, summarizing his views in regard to operation as follows:

1. Operate upon all movable kidneys in which there are present other pathological conditions.
2. In acute symptoms or crises, either painful or mechanical, attempt relief by means of bandages. If these means are successful, give the patient the choice between wearing an orthopædic bandage continuously and an operation. If the bandage does not give relief operate.
3. In case of hysterical or neurasthenic complications, use the bandage first, and do not operate until this has proved ineffectual.
4. In cases of enteroptosis, use simply the bandage and do not operate unless the kidney of itself produces symptoms that are serious and beyond the help of orthopædic surgery. And when operation is required an orthopædic bandage should also be employed.
5. When there are no acute symptoms a bandage should be worn nevertheless.

Catheterization of the Ureters in the Male. (*Journal of Cutaneous and Genito-Urinary Diseases*, December, 1895.) By A. Bradley Gaither, M.D.

The methods here given are those introduced and practised by the late Dr. James Brown.

The Nitze-Leiter cystoscope, with Brenner's modification, is used. The operating-table should be ninety-two centimetres high, with an extension on the top forty-five centimetres wide, projecting forty centimetres. The patient lies on his back, with his buttocks on the end of the projecting board, the legs widely separated and resting on stools sixty-four centimetres high.

The urethra is irrigated with a 1 : 40,000 bichloride-of-mercury solution, and two cubic centimetres of a four-per-cent. solution of cocaine are injected into the deep urethra, and four cubic centimetres into the anterior. It is sometimes necessary to use ether or chloroform.

The bladder is washed, through a metal catheter, with Thompson's fluid, which is run in by siphon, care being taken not to distend the bladder. When the solution returns clear, the bladder is emptied, and from one hundred to three hundred cubic centimetres are introduced.

The electrical power for the light is obtained from a four-cell storage battery made by the Southern Electric Company. The connections should be made and the light tried with the cystoscope in the jar, just before introducing into the bladder. The cystoscope, having been sterilized in a five-per-cent. carbolic-acid solution for one hour, and then lubricated with glycerin, is introduced, and absorbent cotton wrapped around the ocular end to take up the few drops that will escape between the time the stylet is removed and the catheter inserted. The ureter of the suspected kidney is first sought, and if it is not easily found it may be located by occasional jets of urine shooting across the window. The presentation can be changed by raising or lowering the patient's leg, or it may be necessary to increase or diminish the amount of fluid in the bladder. When ready to catheterize, the stylet is withdrawn and the catheter quickly slipped into the canula.

As the catheter is pushed into the ureter, it can be distinctly seen running under the mucous membrane of the bladder. It is introduced eight centimetres, and, while in the ureter, is kept under constant observation. The first drops appear in from one to five minutes, and are allowed to escape. A sterilized test-tube receives the urine, and in from five to ten minutes enough can be collected for the purpose of analysis. The Nitze-Leiter cystoscope can be used continuously if the current is turned off for one minute at the end of each ten minutes.

It is essential in all cases, in order to catheterize the ureters, first, that the bladder shall be capable of holding sufficient fluid to bring the mouths of the ureters into view; second, that cystitis or hæmaturia do not exist to such a degree as to render cloudy the fluid introduced into the bladder before a reasonable time has elapsed.

The Technique of Maunsell's Method of Intestinal Anastomosis.
(*New York Medical Journal*, December 14, 1895.) By Frederick Holme Wigin, M.D.

The writer, at the request of Mrs. Maunsell, has revised an article written by Dr. Maunsell which gives the technique of his method of intestinal suture.

After the preparation and anæsthetization of the patient, a median incision is made in the abdominal wall below the navel, or if the site of the disease or injury can be localized, the incision is made over that site. The portion of intestine to be excised is then located and brought outside of the cavity, together with about six inches of healthy intestine on either side. It is next emptied of its contents above and below the diseased part by passing it between the finger and thumb and gently compressing it. The empty gut is then clamped on either side of the diseased portion at points six inches distant.

The general peritoneal cavity is shut off by flat sponges rendered sterile and wrung out of a hot saline solution, and the exposed portion of the bowel should be protected by the same means. The portion of intestine to be removed is excised by means of a V-shaped incision, which has its apex in the mesentery and its lateral borders on either side of the diseased point. The mesenteric vessels are ligated before being cut by passing a needle armed with catgut around them, and tying it, or they can be ligated as they are divided.

The divided ends of the intestine are washed with a hot saline solution, followed by a small quantity of a fifteen-volume solution of hydrogen dioxide, and the proximal and distal ends are united primarily by means of two temporary sutures, the first placed at the mesenteric border, and the second directly opposite at the highest point of the superior border. These are tied and left with long ends.

A longitudinal incision, an inch and a half long, is next made in the superior border of the larger intestinal segment, two inches from its severed end, by pinching up the intestinal coats between the finger and thumb, and dividing them with a narrow-bladed knife.

The long ends of the temporary sutures are caught up and drawn through the opening until the ends of the segments of the bowel are invaginated and made to appear through the incision as concentric rings. The ends of the long sutures are then held by an assistant while the sutures, twenty in number, are placed and tied. A fine, straight needle armed with a strand of horse-hair is used, and is passed through all the coats of the bowel and through both sides about a quarter of an inch from the divided ends. The suture is caught up by forceps, divided in the middle, and tied at once on either side. The temporary sutures are then cut off, the cut ends of the bowel are dusted over with either iodoform or acetanilide, and the invaginated portion is reduced by means of gentle manipulation accompanied by slight traction. The edges of the longitudinal opening are turned in, and it is

closed by Lembert sutures passed through the peritoneal, muscular, and submucous coats.

An anastomosis of segments of ileum and colon may be effected by passing three temporary sutures, one at the mesenteric border, a second through the side of the larger segment at the point where the superior border of the smaller segment touches it, and a third is passed through the highest free end of the larger segment. The ends of the sutures are drawn through as before, traction is made, and the free edge of the larger segment is inverted and invaginated, being accompanied by the smaller segment which is only invaginated. If the difference of calibre between the two segments is great, a V-shaped portion of the convexity of the larger segment may be removed. Gastro-enterostomy is performed as follows: A portion of the jejunum is drawn out, emptied of its contents, and clamped. A portion of the greater curvature of the stomach is also drawn into the incision and the jejunum is fastened to it by several Lembert sutures in such a way as to lessen strain on the permanent sutures. An incision is then made in the superior border of the gut and a corresponding opening in the stomach an inch above the greater curvature and parallel to it. The extreme ends of these wounds are united by sutures which are tied and left with long ends. An opening is then made near the centre of the stomach, the wounds in the bowel and stomach are invaginated through it and sutured, as already described. The invagination is then replaced and the slit in the stomach closed by Lembert sutures.

The author has found, in his various experimental intestinal anastomoses performed in accordance with this method on dogs, the following points in the technique to be of consequence:

1. The longitudinal slit which is made in the segment of bowel having the greatest calibre (proximal or distal), and through which the invagination occurs, should be located at least two inches from the cut end of the bowel.

2. The mesentery of both segments must be included in the first temporary suture which is passed at this intestinal border; this prevents sloughing of the bowel at this point.

3. The sutures should be placed at least a quarter of an inch from the cut intestinal edge; they should be interrupted, about twenty in number, and should not be drawn too tightly when they are tied.

4. The best suture material for this work is carefully tested and prepared horse-hair.

5. The needle best adapted to this work is a round, straight one (mil-liner's, Nos. 6 to 9).

6. The invagination after the sutures have been placed must be carefully reduced, rather by manipulation than by traction, otherwise the sutures may cut out.

7. In closing the longitudinal slit too much of the intestinal edges should not be turned in, or a contraction may result at this point.

A Case of Gastrotomy for the Removal of Hair-Ball; Recovery.
(Journal of the American Medical Association, February 1, 1896.) By W. L. Allen, M.D., Davenport, Iowa.

A hair-ball was removed from a female, aged sixteen, and had the following dimensions: diameter, cardiac to pyloric extremity, nine and a half inches; entire length, including duodenal part, seventeen inches; circumference at pyloric extremity, eight and a half inches; circumference at greater curvature, eight and a half inches; circumference at cardiac extremity, five and a half inches. The girl had been in the habit of eating her hair since she was three years old, and up to two years ago. The large size of the foreign body did not interfere with a fair degree of health.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
 New York City,

GUY HINSDALE, M.D.,
 Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
 New York City,

WM. G. SPILLER, M.D.,
 Philadelphia.

Diphtheritic Paralysis.—Felsenthal, in a recent critical digest of the literature of paralytic phenomena following diphtheria, reaches conclusions, some of which are as follows: Paralysis of the heart, most important, may occur at any period of the disease, and as late as the sixth week of convalescence, the cause, in the latter instance, being a myocarditis. The advice of Henoch, "Never give a favorable prognosis in diphtheria until six weeks shall have elapsed after all local signs have disappeared," is wise therefore. Symptoms indicative of impending cardiac paralysis are apathy, pallor, anorexia, insomnia, emesis, and præcordial pain. (Another writer notes epigastric pain of acute and obscure origin as also having a very constant premonitory significance.) The heart-tones become distant, the second sound showing the gallop rhythm. The respirations are accelerated, merging towards the termination into the Cheyne-Stokes type. Recovery, which is rare, is always tedious, and convalescence covers a period of many weeks or even months. The sole indication in treatment is to sustain the heart pending the disappearance of the diphtheritic intoxication.

The author does not sufficiently emphasize the value of strychnine in proper dosage hypodermically (from $\frac{1}{60}$ grain to $\frac{1}{8}$ grain) in these cases. It is the most reliable therapeutic recourse available, and its use should constitute, at least internally, a part of the routine treatment of all cases of diphtheria from the inception of the disease. With the paralysis of the velum, manifested by nasal voice, regurgitation of food, etc., there may be paralysis of the œsophagus, epiglottis, and larynx, with anæsthesia, which latter condition

involves the danger of choking from food entering the larynx and bronchi, a danger readily obviated by the use of a soft rubber tube, which should always be used in such cases in feeding. The pathological process responsible for the paralysis is that of an infectious neuritis beginning in the nerve-endings contiguous to the primary focus of infection. Changes in the spinal cord, chiefly ganglion-cells, often coexist. The milder cases are self-limited; the more grave, however, demand prompt and active treatment. A case of interest in connection with this subject described as one of paralysis consecutive to a pseudo-membranous angina, recognized as non-diphtheritic by the bacteriological examination (a spray of bichloride had been employed, however), has been reported by Bourges (*Archiv experimentelle de Pathologie*, 1895). Only the streptococcus pyogenes was found, the Klebs-Löffler bacillus being absent in two examinations.—*Der Kinder-artz*, 1895.

Prognosis in Cerebral Hemorrhage.—Barr, in a lecture upon this subject, delivered at the Leeds General Infirmary, presents the following conclusions: In any case of apoplexy due to hemorrhage into the hemisphere, if renal disease, Cheyne-Stokes respiration, or hyperpyrexia, either or all of them, or two of them, are present, the patient will almost certainly die. If no one of these is present and does not supervene, he will probably recover, regardless of the degree or duration of insensibility. Diabetes, chronic alcoholism, typhoid fever, or extreme anæmia (idiopathic) exert an effect just as fatal as associated disease of the kidney in hemorrhagic apoplexy.—*British Medical Journal*, May 18, 1895.

Belladonna with Potassium Iodide as a Means of Preventing Catarrhal "Iodism."—Cohen, acting upon the theory that the catarrh of iodism is due either to iodine being secreted by the salivary glands, or to the circumstance that iodide of potassium is broken up in the mouth after its secretion, and free iodine is liberated, producing the catarrh just as the inhalation of iodine vapor will, gave five minims of belladonna with each dose of potassium, with the primary object of lessening the salivary secretion, the result being satisfactory in each case (*Lancet*, July, 1895).

Valentine has recently revived the suggestion of Erhlich and Koenig, that sulphonilic acid would accomplish the same purpose, exhibiting an almost specific effect, not only upon the catarrh of iodism, but also upon ordinary and more common forms. He suggests the following formulæ:

R Acid. sulphonilic., ℥iiss;
Sodii bicarb., ℥ii;
Aquæ destil., ℥x.—M.

Sig.—Dessertspoonful in water *bis die*.

or,

R Sodii sulphonilat., ℥iiss;
Aquæ destil., ℥viss.—M.
Sig.—Three drachms *bis die*.

Two Cases of Brain Tumor in Two Sisters (Hæmangiosarcoma or so-called Perithelioma) located near the Third Ventricle. (*Deutsche Zeitschrift für Nervenheilkunde*, vol. viii., Nos. 1 and 2.) By Gustav Besold, M.D. Clinic of Professor Strümpell.

The parents of these two sisters are still living and are in good health. The patients, one of sixteen and one of eleven, showed symptoms which made the diagnosis of brain tumor very probable,—viz., rapidly increasing weakness, headache, vomiting, disturbance of sight followed by blindness, due to choked disk, and later to atrophy of the optic nerves; and symptoms of motor irritation,—attacks of tonic contractions, and later in the disease permanent contractures. In both sisters the right side of the body was more involved. Intelligence, speech, hearing were affected, and in one patient the sense of smell was lost. The tumors were not localized, although they were supposed to occupy a median position.

The autopsies showed that the tumor had probably originated in each case from the left optic thalamus, and had soon extended to the right hemisphere; that this had caused internal hydrocephalus by involvement of the veins of Galen, and that to this many of the symptoms were due.

The early appearance of choked disks followed by optic atrophy, the rapid failure of the intellect, the nearly equal paresis of the extremities with increased muscular tonus, the frequent tonic muscular contractions could have led to the diagnosis of a location near the third ventricle with secondary hydrocephalus.

The tumor in each case was a hæmangiosarcoma, or endothelioma, or perithelioma.

The interest of these cases lies in the development of a tumor, almost identical in nature, in two sisters of youthful age, in the same portion of the brain. They are important for the theory of tumor formation in general. Thiersch and Cohnheim have expressed the opinion that many tumors are due to congenital conditions, and it is this theory which Dr. Besold accepts for his cases. In the elder sister other congenital anomalies were present,—an open foramen ovale and a double ureter.

A similar condition of brain tumor in two members of the same family is not known. Strümpell has reported the presence of sarcomata in the kidneys of two brothers.

In one of Dr. Besold's two cases slight degeneration was found in the posterior columns of the cervical cord, especially near the posterior roots, and was believed by him to be due to a general marasmic condition of the patient. In the same cord the tract of Gowers on both sides was degenerated in the upper cervical region.

Local Alopecia in a Case of Traumatic Hystero-Neurasthenia. (*Revue Neurologique*, January 15, 1896.) By P. Ladame, M.D., of Geneva.

A man, of fifty years, fell from a scaffolding, and apparently was not seriously injured, although he was unconscious of the events which had

occurred. There was no trace of nervous or mental disease in his family. After the accident he was very excitable, spoke incessantly, sang, whistled, and struck the persons near him. For three weeks he had incontinence of urine and fæces, and was forced to take morphine in order to sleep. Gradually he became quieter, but suffered from headache and vertigo, and was incapable of all work. His character was greatly changed, his intellectual faculties, more especially his memory, were greatly impaired. The entire frontal region of his head was hyperæsthetic, and more so near a cicatrix over the left parietal bone. At this part his hair had fallen out so that now very little remains; previous to the accident the growth here had been abundant. The fields of vision, especially that of the right eye, were concentrically contracted. The field for red was very contracted, whereas that for green was larger. Hearing was much impaired, but there was a cicatrix in the left tympanic membrane. Muscular force was much diminished in the hands. Sensation was present everywhere for all qualities, but was diminished over the entire right side.

The diagnosis of traumatic hystero-neurasthenia was made, and the loss of hair was attributed to trophic trouble.

Oppenheim has also described alopecia in traumatic neurosis.

Asthenic Bulbar Paralysis. (*Deutsche Zeitschrift für Nervenheilkunde*, vol. viii., Nos. 1 and 2.) By Professor A. Strümpell.

The name of asthenic bulbar paralysis has been given by Strümpell to this peculiar disease. The case which he describes makes twenty-one now on record. The ordinary symptoms as presented by him are the following:

The disease appears usually before thirty, even as early as the age of twelve or fifteen, with, perhaps, a slight preference for the female sex. It commences gradually and without apparent cause, but the evolution may be quite rapid, and result in a most serious condition. Occasionally there is at first pain, never very violent, and mild vertigo. An early and most important symptom is the *rapid fatigue*, usually shown in those muscles whose nerve-centres are in the medulla, pons, and crura. The first symptom may be heaviness of the eyelids and diplopia, or else difficulty in mastication, speaking, or swallowing. Involvement of the trunk and limbs usually occurs later, although the disease may commence in these parts. Muscular twitchings, even in the tongue, usually fail. When the disease is fully developed there is permanent paresis in the levatores palpebrarum, in all the muscles innervated by the seventh nerve, and in the muscles of mastication, elsewhere there is great and rapid fatigue after slight effort, which amounts almost to complete paralysis. This is noticed especially in swallowing, chewing, and speaking, although it is also true of the movements of the limbs. The permanent paresis is found in those muscles which are continually in tonic contraction and have little rest,—i.e., in the levatores palpebrarum, the muscles of expression, and the masseters,—the latter by contraction prevent falling of the lower jaw. In some cases a permanent

paralysis of the muscles of the eyeballs is present, but these are also in constant tonicity, often these muscles are entirely spared. Of the muscles below the head only those of the back of the neck have been found permanently parietic, the same explanation answers here.

Ptosis is often the first symptom, and when the muscles of the eyeballs are spared it is important as showing an involvement of one branch of the third nerve. Reaction of the pupils to light and accommodation always seems to be normal. The extremities are almost invariably involved, but weakness of the muscles of respiration, if it occurs at all, appears late, and the heart or the sphincters have never been found affected. On certain days the patient has much more power than at other times; on the other hand, menstruation impairs the condition.

Sudden relapses are common, and may occur even one or two years after apparent recovery.

No microscopical changes have ever been found in any of the tissues, and from the clinical condition gross lesions could not be expected. Strümpell is disposed to accept the theory of intoxication, though he cannot say if the poison is elaborated in the body or taken from without. It is exclusively an affection of the motor system. The same exhaustion is shown in contractions to the faradic current, which proves that the peripheral neuron is involved, perhaps alone, although the disease may be muscular. The knee-jerk is prompt, and muscular atrophy does not occur even after a long period. The prognosis naturally is always doubtful.

A Contribution to Brain Surgery with Special Reference to Brain Tumors. (*Medical Record*, February 1, 1896.) By M. Allen Starr, M.D., Ph.D.

According to Dr. Starr experience has shown that operations for cortical epilepsy are very disappointing, and that the attacks are almost certain in the end to recur. The cicatrix made by the surgeon is not very different in its effects from that made by a trauma.

Only seven per cent. of brain tumors are open to operation. Removal of a portion of the skull for the relief of intracranial pressure is justifiable where the tumor cannot be located, such a procedure may prolong life and may cause marked change in the circulatory conditions, which aids in the absorptive power of certain drugs. Mercury and iodide of potassium have cured tumors which were not syphilitic. Dr. Starr reports a case of cerebellar tumor in which the diagnosis was based on the most characteristic clinical history, where syphilis was not present, which was to all appearances cured by the use of the above drugs. He confirms Macewen's statement that on the side of the tumor or abscess there is sometimes a clearer, higher-pitched, and more resonant note than upon the opposite side in auscultatory percussion of the skull. He considers it justifiable to operate for removal of the growth where the symptoms seem to indicate that access is easy and that the tumor is superficially located, but the most

reliable symptoms sometimes lead to errors of diagnosis. One of his cases where focal epilepsy had been present revealed at the autopsy a sarcoma deep within the centrum ovale. According to his opinion it is impossible to distinguish accurately between cortical and subcortical tumors. New formations at some distance from the motor region may cause motor symptoms indirectly by irritation or pressure, and ataxia of a cerebellar type may be due to lesions of the frontal lobes. This form of ataxia is usually associated with hemiparesis or monoparesis, localized tenderness to percussion or pressure over the frontal region, optic neuritis occurring late and early development of mental dulness (Bruns). Cerebellar tumor may cause pain in the opposite frontal region. Large incisions for the removal of tumors may be made into the brain without danger to life, but cysts offer a more unfavorable prognosis, as they are apt to form again. In gummatous tumors when antisyphilitic treatment has failed operation is proper. He prefers the flap operation to the operation of trephining.

The statistics which Dr. Starr has collected up to the present time give the following results: Out of one hundred and sixty-two cases operated upon for brain tumor, no tumor was found in forty-eight, in seven the tumor was not removed, seventy-two cases of removal resulted in recovery, thirty-five terminated in death.

Multiple Neuritis the Essential Element in Landry's Paralysis.
(*Boston Medical and Surgical Journal*, December 26, 1895.)

Dr. George L. Walton holds that Landry's paralysis is an acute toxic disease, characterized by rapid loss of power in the lower extremities, trunk, and to a less degree in the upper extremities, affecting also the vagus and phrenic, sometimes other cranial nerves. The affected muscles are lax. Pain, paræsthesia, anæsthesia, and tenderness are generally present in varying degrees, though in some cases sensory disturbances are wanting. Death follows in more than half (sixty-four per cent.) of the cases. Recovery, when present, is very slow. The reflexes, deep and superficial, are lost at an early stage; wasting and reaction of degeneration appear if the patient survives. The process is a toxic affection of the peripheral nerves (neuritis), cord, and brain, the former being the essential and persistent lesion.

In the case which Dr. Walton minutely describes, the infection arose from pyelitis due to stone in the kidney. After removal of the calculus and thorough drainage, complete paralysis of the lower extremities persisted with marked wasting and coolness.

Horse-Nettle (*Solanum Carolinense*) in the Treatment of Epilepsy.
(*Journal of the American Medical Association*, December 14, 1895.) By C. F. Barber, M.D.

Dr. Barber used the remedy on insane epileptics, and his experience was that the immediate results were encouraging, for no convulsions occurred

for days. For several weeks the improvement continued, some of the patients brightening mentally. He concludes:

1. That *solanum carolinense* is not a substitute for the treatment now generally accepted for epilepsy.
2. That it is a preferable substitute for the bromide treatment when compared with the use of biborate of sodium.
3. That it unquestionably has an influence over the disease, although mild. It sufficiently controls the disease to warrant us in substituting it for a time to relieve our patients of the depression produced by the bromide treatment.
4. That its toxic effects are *nil*.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,
Paris, France.

Enchondroma of the Cartilage of the Upper Lid. (*Journal of the American Medical Association*, November 9, 1895.)

Peter D. Keyser, of Philadelphia, has had the rare good fortune to make a careful clinical and microscopical study of this almost unique form of neoplasm.

Eight years previous to the report the subject, a fifty-eight-year-old woman, presented herself at his clinic at the Wills Eye Hospital with a round lump in the upper lid which she said had been slowly growing without any sign of inflammation for a year or two. The tumor was hard and solid, and was firmly attached to the cartilage. An incision was made along the lid over the tumor and the convexity was shaved off. This was found to be firm, cartilaginous, cutting crisply, and presented a yellowish-white appearance, like thickened cartilage. No microscopic examination of the part removed was made.

In 1890 the patient reported with a much larger return of the growth. It was again operated upon as in the former method. No examination was made. In 1892 the tumor had grown again, and appeared more nodular. At this time the author's purpose was to try to remove all of the diseased cartilage, leaving, if possible, the conjunctiva, so as to protect the cornea. To do this, the edge of the lid was carefully slit up, and as much as possible of the cartilage was removed. This seemed to do well for awhile, but after six or eight months the growth again began to rapidly develop, growing along the whole cartilage and taking upon itself a well-developed nodular form with a small open sore upon the edge of the lid.

Operative interference to remove the unsightly looking lid and to relieve distress was again deemed necessary. The edge of the lid was slit and the skin was dissected sufficiently to expose the whole growth. The cartilage of the nodule on the nasal side with the conjunctiva was removed, while that of the temporal side was dissected out as much as possible, leaving the conjunctiva.

The removed portion was prepared for microscopic study. Careful examination showed that the growth was of an enchondromatous formation, and, as it was a simple outgrowth from the normal cartilage, it was decided that it might come under Virchow's term of enchondroses. There were well-developed walls with the cartilaginous cells lying therein, some of which were separated, while others were packed closely together. There was also glandular tissue.

An Alveolar Fibro-Sarcoma of the Optic Nerve. (*Archives of Ophthalmology*, April, 1895).—Finlay, of Havana, Cuba, has had the good fortune to study the histological appearances of an alveolar fibro-sarcoma of the optic nerve, which occurred in the practice of Lopez, of the same city. As he says, it was curious to note the difference in the structure presented by the tumor at different points. He found that it was instructive to follow the transition from the more highly organized alveolar sarcomatous condition to the more atypical ordinary variety and into the still more lowly organized myxosarcoma.

In a careful analysis of the statistics of the results of operative procedure in such cases, he believes that "an operative interference is called for as soon as the diagnosis is made, as the tumor, if left to itself, will almost necessarily produce death, and the earlier the operation is performed the greater the chance of success." He thinks that the comparatively large proportion of deaths immediately after the operation makes a strict adherence to the rules of aseptic and antiseptic surgery a necessity, and that the presence of metastatic growths within the cranium or of a direct intracranial extension seems to predispose to infection of the meninges; if such an extension can be inferred, all operative interference, with a radical cure in view, is contraindicated.

He says that, in view of the good statistical returns, an attempt at preserving the eyeball is justifiable and even recommendable, provided an ophthalmoscopic examination permits one to infer that there is no extension of the growth into the interior of the eye, and that the presence of the eyeball does not interfere with the complete excision of the tumor by limiting the field of operation.

He believes that where there is any suspicion of an extension into the orbit, an exenteration should be performed, and says that the results of operation on recurring growths are not encouraging, but thinks that an exenteration of the orbit may be at times beneficial, provided that there are no grounds to suspect an intracranial extension.

Report of a Case of Scopolamine Intoxication produced by the Instillation of Four Drops of a Four-Grain Solution of the Drug into Each Eye. By Edw. E. Hazlett, M.D., Health Officer of Dickinson County, Abilene, Kansas. (Personal Communication to Dr. Oliver.)

"E. P., female, aged six years, of nervous temperament, but in perfect health, was brought to me for adjustment of refraction. Preliminary examination: V. both eyes = $\frac{6}{1\frac{1}{2}}$. Instillation of two drops of a four-grain solution of scopolamine hydrochlorate in each eye and repeated in ten minutes was immediately followed by a dazed and stupid condition. Her gait became staggering and she dragged her feet as if very tired. Speech became difficult, and when spoken to she failed to answer intelligently. Examination was discontinued and the child, unable to walk, was carried home. Several hours later I was called to find her actually maniacal. Reclining on a lounge, when placed in sitting posture she would reel as if drunken. Mentally, she was greatly agitated with profound delusions and hallucinations, seeing not only wild beasts and a man that was trying to kill her, but the letters of Snellen's test-type everywhere, on the walls of the room and on adjacent buildings. She would cry out in an excited manner, pointing with her finger, 'See that big N over there,' and would then rapidly name many of the larger letters of the test-types. She would constantly reach for some imaginary object and go through the motions of eating it or of otherwise disposing of it. This condition lasted about ten hours, when, under the use of sodium bromide, she quietly fell asleep, to awake some six hours later in a normal condition."

The letter further states,—

"Three years since I had a case of acute mania lasting three or four days from the use of a four-grain to an ounce solution of atropine occurring in the eleven-year-old daughter of a neighboring physician. Recently I examined this child after the use of scopolamine from the same solution as that used in the case I now report, with no untoward effects."

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Researches on the Anatomical Alterations of the Optic Nerve in Intoxication by Ethereal Extract of Male Fern. (*Bulletin de l'Académie royale de Médecine de Belgique*, Series iv., vol. ix., No. 10, 1895.) By M. M. Masius and A. Mahaim, of Liège.

In intoxication by the ethereal extract of male fern, the anatomical alterations of the optic nerve vary, not alone with the intensity and rapidity

of the poison, but also with the portion of the nerve examined, whether it is situated in front of, within, or behind the optic foramen. In a dog that had been given two- to three-gramme doses of this drug every other day for two months, and that had been blind for two months and a half, the following conditions were noted: Near the retina the interfascicular connective tissue is thicker than normal; but no sections of blood-vessels can be seen. In the neighborhood of the optic foramen there are an enormous number of capillaries with particularly thick walls. In the centre of the nerve, near the optic foramen, cavities exist, which are limited by a wall in which the altered capillaries are found. These cavities are partly occupied by a clear grayish mass. This mass is composed of finely granular cells, with a pale protoplasm and a small nucleus which is poor in chromatin, but which in certain nuclei is arrayed in the form of karyokinetic figures. The alterations are primarily vascular. The inflammation of the capillaries appears, whilst the nervous tissue is exempt. When these vascular changes are at their height, when the proliferation of the vessels and the thickening of their walls becomes such that there is no place for the nerve fibres compressed between these vessels and the optic foramen, these nerve fibres disappear completely without leaving any trace. If the alteration of the capillaries is not too great the most of the nerve fibres persist, certain ones presenting atrophy. The lesions of the nerve fibres, then, are secondary and proportional to the degree of change in the capillaries. This confirms the opinion of authors who claim that the vascular lesion is the primary cause of neuritis. This vascular lesion consists in a cellular infiltration which dilates and fills the space between the endothelium and the perivascular sheath. At this stage this infiltration resembles the cellular infiltration pointed out by Raymond in the capillaries of the cerebral cortex of general paretics. One is able, even, to compare it to the cellular infiltration of the adventitia of the arterioles which one meets in medullary syphilis. This inflammation is clearly distinguished, however, from changes due to syphilis, in that it gives place ultimately to the formation of an abundant substance which distends the perivascular lymphatics and constitutes a wall of great thickness to the capillary. On the other hand, the capillaries of dogs intoxicated by male fern never present endarteritis. We note also the polymorphism of the mesodermic cells of new formation which are the agents of the anatomical change. In the beginning the nucleus of one of these cells is round or oval, and the protoplasm is scarcely visible. The nucleus in no wise recalls the large crenated nucleus of the leucocyte. Later, at the point where the vascular changes are started, the nervous tissue rapidly disappears, the newly-formed cells multiply, their protoplasm increases, and they form, in this manner, a cellular mass which fills up the space left by the nervous elements. This mass is deposited, by preference, behind the optic foramen, because the peripheral ends of the compressed fibres degenerate more rapidly than the central ends. Around the changed capillaries the newly-formed cells degenerate; their protoplasm becomes extremely

clear and presents vacuoles, their nuclei are nothing but vesicles and do not stain with carmine. Finally, in the centre of the nerve, these newly-formed cells have lost their protoplasm, and a nucleus without a nucleolus may be found in the centre of a cavity, denoting the position of the protoplasmic body.

Weigert's New Method of staining the Neuroglia. (Beiträge zur Kenntniss der normalen menschlichen Neuroglia, mit 13 Tafeln. Festschrift zum fünfzigjährigen Jubiläums des ärztlichen Vereins zu Frankfurt a. M. Erscheint gleichzeitig als Heft ii., vom Bd. xix., der "Abhandlungen, herausgegeben von der Senckenbergischen naturforschenden Gesellschaft." Commissionsverlag von Moritz Diesterweg. Abstracted by Professor C. v. Kahlden, in *Centralblatt für allg. Path. u. path. A.*, Nos. 20 and 23, 1895. Translated by Dr. W. G. Spiller.)

Weigert remarks, in Section X. of his publication, where the technique is contained, that a method for coloring the neuroglia should answer the following requirements :

1. The stain must be elective,—that is to say, nothing should be colored which could be confused with neuroglia-fibres or interfere with their prominence. All methods must be discarded in which the staining of the axis-cylinder and the dendritic processes may not with certainty be avoided. All methods which color the body of the Deiters' cells in the same tint as the neuroglia-fibres,—that is, all methods in which the fibres appear as true processes of these cells may not be employed for the topographical study of the neuroglia. Weigert says, the fact that the connective tissue is also colored is not so important, as the structure of the neuroglia and of the connective tissue is so different that confusion is hardly to be feared.

2. The method must be sure,—i.e., every properly-prepared preparation should show in every part every single neuroglia-fibre present. In regard to this point Weigert remarks, "In the full sense of the word, I have not been able to fulfil this requirement, in spite of many years' endeavor. In the interior of the preparations spots appear where neuroglia should be present ; however, the method is quite certain."

3. It is very desirable that in a neuroglial stain other elements should be made recognizable, at least as far as is necessary for orientation. It is especially necessary in pathological processes that the nuclei should show, and it does not matter if these are colored in the same tint as the neuroglia. On the other hand, the nervous elements should be stained in a contrasting color.

4. The fibres must not be colored too faintly. Although in the original attempts made by Weigert the fibres were stained so faintly that they could scarcely be recognized as such under feeble magnifying power, now a more distinct tint has been obtained.

5. The preparatory hardening must, if possible, not last too long a time. The new neuroglial method from Weigert answers this requirement.

6. The preparations must not shrink or become friable in the hardening fluid. This requirement has also been met by Weigert.

7. A final condition, that the preparations should be permanent, has not been positively fulfilled, but sufficiently so.

The method is as follows:

I. Fixing and mordanting in a solution prepared by heating:

Chrome-alum, 2.5 parts;

Water, 100 parts.

To this hot solution, without further heating, add

Ordinary acetic acid, 5 parts;

Finely powdered neutral acetate of copper, 5 parts.

Stir well. After cooling, add ten per cent. of formol.

Small pieces of tissue, which are not longer than one-half centimetre, should be allowed to remain in this solution at least eight days. A longer time does no harm. After this they should be washed with water and alcohol, and placed in celloidin. If it is desired to stain also according to other methods, it is necessary to fix and mordant separately, and the small pieces not over one-half centimetre thick should be placed in a ten-per-cent. solution of formol, and afterwards in the mordant above described, without the addition of formol.

II. *Reduction*.—The sections are then placed for about ten minutes in a one-third-per-cent. solution of permanganate of potassium, washed with water after careful removal of this solution, and then placed for two to four hours in a filtered reducing solution, made as follows:

Chromogen, 5 per cent.;

Formic acid, 5 per cent.;

Water, 100 per cent.

To every ninety cubic centimetres of this solution ten cubic centimetres of a ten-per-cent. solution of sodium sulphate should be added before the solution is employed. In this solution, after ten minutes, the sections made brown by the permanganate of potassium are decolorized. The chromogen can be had from dealers in rare chemicals.

III. *Staining*.—Weigert's well-known fibrin-stain is used for this purpose, with certain modifications.

1. Methyl-violet is used as color. It is not employed in aqueous solution, but in an alcoholic solution (seventy to eighty per cent. alcohol), saturated while hot, and poured off from the sediment after having been allowed to cool. To every one hundred cubic centimetres of this solution five cubic centimetres of a five-per-cent. aqueous solution of oxalic acid should be added.

2. The solution of iodine and iodide of potassium is the same as in the fibrin method,—a saturated solution of iodine in a five-per-cent. solution of iodide of potassium.

3. The mixture of anilin oil and xylol should not be applied in the proportion of two parts anilin oil to one part of xylol, but equal parts by bulk of both should be taken.

The staining, as well as all other steps, should be done on the slide. The sections must lie smooth on the slide. They usually adhere well to a slide previously rubbed off with alcohol, when they are placed in a large vessel filled with water, and caught up by the slide placed under them.

The coloring is almost instantaneous. It does no harm, but likewise it is of no advantage, to leave the staining solution any length of time on the section. The mixture of anilin oil and xylol must be very carefully washed off several times with pure xylol before the balsam is placed upon the section, otherwise the preparations are not durable. In this respect neuroglia is more sensitive than fibrin. Preparations are more durable if they are not at once placed in darkness, but are allowed to lie exposed to diffuse daylight for two to five days.

Up to the present time the neuroglial stain can only be well applied on the human central nervous system. It is not yet to be recommended for that of animals. Rabbits' brains, at least, show the neuroglia only imperfectly,—not electively stained. The cause of this has not yet been ascertained.

When the method has been applied in this manner the neuroglia-fibres are stained faintly; the connective tissue is colorless. Ordinarily, the absence of color in the connective tissue is not important. It is better to place the sections, after pouring off the reducing fluid and after washing twice with water, in a simple (not acidulated) saturated 5-per-cent. aqueous solution of chromogen, and to leave the sections overnight in this carefully filtered solution. They should then be again washed with water and stained. In this way the collagenous tissue is stained blue with a violet tint; and the neuroglia-fibres are much darker, so that even the finest are visible; and, what is also of great advantage, the ganglion-cells, the ependymal cells, and the larger axis-cylinders assume a yellowish tinge.

If it is not possible to color the sections immediately after reduction, they should be placed in

80 per cent. alcohol, 90 cubic centimetres;

5 per cent. oxalic acid solution, 10 cubic centimetres.

If placed in water or pure alcohol, the sections soon become incapable of being stained.

As Weigert has already in part stated, a staining method quite similar in principle may be used for many other tissue elements; for the bile capillaries, the cuticular substances in the kidney epithelium, and other epithelial cells, as well as splenic structures, the double-refracting substance of the transversely striated muscular fibres, etc. Concerning these points, the author purposes further communications.

However, there are two important statements made by Weigert which concern the fibrin stain and the myelin stain.

The fibrin stain may also be used on sections from chromic acid preparations if they have been allowed to lie a certain time, better still some hours, in a five-per-cent. oxalic acid solution.

The hardening and mordanting necessary for the myelin stain can be shortened to four or five days, if the following solution is employed :

Bichromate of potassium, 5 ;
Chrome-alum, 2 ;
Dissolve by heating in water, 100.

If a sediment forms on cooling, the solution should be filtered or poured off. Only small pieces should be placed in this solution. Larger pieces may first be hardened in formol, and afterwards smaller pieces may be cut from these for the above-mentioned solution. The mordanting must be completed in four or five days. If the pieces are allowed to remain a longer time in the solution of chrome-alum and bichromate, they become friable.

The above-mentioned neuroglial mordant may also be applied, and if this has been done sections do not require to be placed later in copper.

In the first nine sections of the work, after an historical review, he discusses the relation of neuroglial fibres to the cells, the neuroglial nature of the fibres stained by the new method, their relation to connective tissue, the histogenesis of the neuroglia, its histological peculiarities, and its general and special topography.

Weigert defines the limitations of the method in the following words : "The method is not adapted to tracing embryological development of the neuroglia very far. Along with the staining of the nuclei of the neuroglia-cells, the method stains only those fibres which, as we will see, are differentiated in a peculiar manner. If, therefore, associated tissue exists in the central nervous system, as theoretically cannot be disputed, which does not contain such differentiated fibres, it fails entirely to be observed by application of the method." These deficiencies are for the pathological anatomist of very little importance. The nuclei of all the cells—the red blood-corpuscles in the vessels—are stained, as well as the neuroglia-fibres. The cell-bodies of the larger ganglion-cells are stained yellow, the larger cell processes and the axis-cylinders are likewise given a yellowish tinge, the finer processes are invisible. The cell-bodies of the smaller ganglion-cells are stained faintly or not at all, the bodies of those cells which are considered neuroglia-cells are likewise unstained,—therefore invisible. The gradual disappearance of the neuroglia-fibres within the invisible protoplasm is not to be observed. Neuroglia-fibres which have previously been considered as processes of Dieters' cells are therefore not chemically identical with their protoplasm, but are very different from this chemically. This chemical distinction does not appear gradually, in the so-called processes, at a greater or lesser distance from the cell-body, but the difference exists at

once, even in the immediate neighborhood of the cell-nucleus. Most of the so-called processes are no processes at all, as two of these may form a common filament passing across the cell, and not interrupted by the cell-body, as must be the case if they were processes, each one then having its origin in the cell-body.

Although Frommann, and later Golgi, and nearly all recent writers, following in their footsteps, have said that the neuroglia consists only of cells and their processes, this is true in man only in the embryological period. In full development the neuroglia consists of cells and fibres of which the latter predominate so greatly that they must be considered as the essential elements.

These fibres can therefore certainly not be considered as nervous inter-cellular tissue.

1. Because in the new method all that is nervous tissue remains uncolored; the fibres, however, are tinged dark blue.

2. Because the fibres consist of a modified non-protoplasmic substance, distinct from the cell-body.

3. Because the fibres (and the appertaining cells) behave pathologically exactly as connective tissue,—that is, they proliferate when the specific nervous tissue has been destroyed. Nothing positive can be said concerning the nature of the fibres as yet. Of the negative results the most important is that they are totally different from all fibres of ordinary connective tissue. Pathologically, connective tissue is never formed from neuroglia, or *vice versa*.

As already mentioned, the method of Weigert is not adapted to embryological investigation, as in the early embryological development no distinct fibres exist. In regard to histogenesis Weigert emphasizes the fact that in his preparations the neuroglia-fibres morphologically and chemically are uniform, and that it cannot be assumed, as is done by many, that one portion of the fibres originates in the mesoderm, another in the ectoderm. As an ectodermic origin has been demonstrated by different methods, it is necessary to assume “an uniform ectodermic origin of Dieters’ cells,—that is, of the neuroglia in our sense.” If the theory of an epithelial origin of the neuroglia, which has the type of connective tissue, sounds somewhat paradoxical, “one must not be astonished at what appears paradoxical in these relations, as the epithelium of the medullary plate possesses peculiarities very paradoxical to the nature of all other epithelium.” In this connection Weigert refers to the penetration of the epithelium by interstitial fibres in later life, and to the origin of the nerve-cells from epithelial cells, which in their form and physiological characteristics differ completely from other epithelial derivatives.

Of the other histological peculiarities of the neuroglial fibres it may be mentioned that their course is straight, or nearly so, or notably curved. They are never sinuous, such sinuosities occur rather from contraction of the preparation. The fibres are solid, at no part do they show a tubular for-

mation. They are very regular and appear granular only when the spinal cord has not been placed sufficiently fresh in the fixing fluid. They do not possess moss-like or other processes, nor do they ever show those conical or flask-like enlargements such as are pictured repeatedly in Golgi preparations. The fibres are of different thicknesses, from the very finest to those 1.5 micro-millimetres thick. The very thick fibres occur only under pathological conditions, for example, in the cerebral cortex in general paralysis. Weigert has not observed division or anastomosis of the neuroglia-fibres.

Weigert makes the following statements concerning the general topography of the neuroglia-fibres :

1. A thick layer of very closely woven neuroglia-fibres is always found under the epithelium of the ventricles and of the central canal. This reticulum is the densest which occurs normally in the central nervous system. The choroid plexus, likewise lined with ventricular epithelium, offers an apparent exception ; this contains neuroglia only where it is combined with nervous tissue.

2. In general, though not entirely without exception, the external surfaces of the central nervous system possess likewise a thickening of the neuroglia.

3. The same is true in those parts where formerly an internal or external surface was present, but which has disappeared in the process of development, for example, in the cornu ammonis.

4. The interior of those portions of the nervous tissue where superficial-like boundaries are to be found, are characterized by an increase of neuroglia-fibres. Such places occur, for example,—

(a) When the nerve-fibres of the white matter form dissociated bundles.

(b) About the ganglion-cells, where neuroglial reticula ("Neuroglia-körbe") may be seen.

(c) At the borders of the perivascular spaces. The neuroglial masses may be very prominent here, even more so than on the external surface. The neuroglia-fibres are here chiefly parallel to the axis of the vessel. A spiral and a radiating course occurs also, the latter especially in general paralysis.

5. Concerning the general topographical relations of the white matter the general rule may be made that nearly every medullated nerve-fibre is separated from those about it by a neuroglial reticulum. This law, however, applies only to the white matter proper ; where gray matter occurs between the individual medullated fibrils, intervening neuroglia may be, but need not be, present.

6. General rules cannot be made for the gray matter.

7. Not even the slightest connection can be demonstrated between neuroglia-fibres and nervous structures.

The special topography of the neuroglia—treated of in the following chapter—must be left to the original report, as the many interesting details would far exceed the limits of an abstract.

Regarding the physiological qualities the following points may be mentioned :

It is positive that the neuroglia has a space-filling function. "This is shown especially by pathological histology, for wherever space is made by destruction of nervous tissue the neuroglia proliferates and fills the area thus left free. Greater or smaller quantities of neuroglia-fibres fill the spaces left free by degeneration, whether this destruction involves the myelin sheath alone, as is said to be the case in disseminated sclerosis, or the entire nerve-fibres, as in tabes and secondary degeneration, or whether entire nerve-cells are destroyed, as in anterior poliomyelitis, or only portions of the same, as in progressive paralysis, or whether the entire nervous structure (cells and fibres) is destroyed, as in ischæmic necrosis. I would emphasize especially, although contrary to a former view expressed by me, that the dense cicatricial tissue following ischæmic necrosis does not contain connective tissue, as is easily demonstrable by the new method, but consists of tightly woven large masses of neuroglia."

A nutritive function by union of the ganglion-cells with the processes of the neuroglia-cells does not exist, inasmuch as this imagined union does not take place. Likewise the theory that neuroglia-fibres as very small capillary serous vessels may conduct nourishment must be discarded, as the fibres are not hollow, as was formerly believed.

Weigert opposes the hypothesis that the neuroglia serves for the isolation of innervation for various reasons. Indeed, the chief assumption that the neuroglia of the white matter is more abundant than that of the gray, which is mentioned in support of this theory, is not at all correct. On the contrary, the great variation but still typical arrangement of the neuroglia in the different portions of the central nervous system, as well as the different quantities on the superficial surfaces, seem to indicate that "some sort of statical laws govern the different forms of reticula in a manner similar to that which has long been demonstrated for other connective tissues, as for the arrangement of the normal bone trabeculæ, by Culmann, Herman v. Meyer, among others; for the pathological conditions of bone, by Julius Wolff; for the fibres in the dolphin's fin;" or for the ramifications of the blood-vessels, by Wilhelm Roux, etc.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

APRIL, 1896.

[No. 3.

ORIGINAL COMMUNICATIONS.

A STUDY OF CHOLEDOCHOTOMY.

BY WILLIAM S. MAGILL, M.D., and MAURICE JOURDAN, M.D.,
of Paris. of Marseilles.

(Continued from page 109.)

GROUP II., A.—CHOLEDOCHOTOMY ASSOCIATED WITH INTERVENTIONS ON THE GALL-BLADDER OR BLADDER AND CYSTIC DUCT AT THE SAME TIME.

1. CHOLEDOCHOTOMY AND CHOLECYSTECTOMY. (9 Cases.)

No. 26. Surgeon: KÜMMEL. **Sex and Age:** Female, forty-four years. **Clinical History:** Hepatic colic frequently repeated for several years; jaundice very intense for some weeks. **Actual Condition:** Chronic jaundice. **Operation Notes:** February 6, 1884. Small contracted gall-bladder united by fibrous adhesions to the inferior surface of the liver; two calculi in the bladder, which is extirpated; stone, in the common duct, as large as an English walnut; extraction of this after incision of the duct wall; the common duct greatly dilated, presented the volume of a normal gall-bladder; catgut to close the incision; long operation; shock. **Result:** *Death*, in collapse, twenty hours after the operation.

No. 27. Surgeon: REHN. **Sex and Age:** Female, forty-three years. **Clinical History:** For some years hepatic colic, more and more frequent, complicated with jaundice, disappearing a little the last few months. **Actual Condition:** No jaundice; liver of increased size; in the region of the gall-bladder a tumor can be felt, which extends a little beyond the inferior edge of the liver. **Operation Notes:** March 10, 1891. Incision parallel to the right costal border; gall-bladder covered by the adhering omentum, its walls thickened; dissection of the bladder; stones in the common duct, by incision of which four calculi are removed; catheterization of the ducts; suture of incision; ligature of cystic duct with removal of the gall-bladder, which contained several calculi; no drainage. **Result:** Recovery complete in twenty-three days. Visited one year later, the complete cure is noted.

No. 28. Surgeon: ABBE. **Sex and Age:** Female, thirty-six years. **Clinical History:** First hepatic colic two and a half years ago, followed by jaundice, which had since

persisted. **Actual Condition:** Intense jaundice; liver of greatly increased volume; tumor under the edge of the liver (adhesions). **Operation Notes:** April 13, 1891. Vertical lateral incision; stomach adheres to the gall-bladder and to the liver; gall-bladder very small; is incised together with the cystic duct; calculi removed; the incision is prolonged on the common duct, from which a stone is also removed; the hepatic canal is so dilated that the finger can be introduced; silk stitches close the incision of the common duct; excision of the gall-bladder and cystic duct, leaving the hepatic open; drainage by a small rubber tube introduced into the hepatic duct; large glass drain for the site of operation; iodoform packing. **Result:** Recovery; the bile flows out from the drain in great abundance; colored stool the ninth day; operative closing of the fistula at the end of a month. Visited in October, 1891, the perfect recovery is noted.

No. 29. Surgeon: ROUX. Sex and Age: Female, forty-six years. **Clinical History:** Violent hepatic colic for several years, very painful and accompanied with a moderate jaundice lasting only a short time, and not discolored the stools; an intermittent fever; impaludism. **Actual Condition:** Slight jaundice. **Operation Notes:** June 16, 1891. Vertical lateral incision; contracted gall-bladder no larger than the finger; its incision shows that it contains no calculi, but the friability of its walls determines a cholecystectomy; suture of the cystic duct after invagination of the mucous coat; in the common duct, near its termination, a series of calculi is found, the stones as large as the extremity of the finger; incision, extraction of four calculi; two rows of silk stitches close the incision; iodoform packing. **Result:** Recovery; for a few days the bile flowed from the wound. Visited June 18, 1895. A hernia as large as a hen's egg is noted at the site of the abdominal wound; some malarial fever, easily controlled by quinine; otherwise complete cure.

No. 30. Surgeon: STUDSGAARD. Sex and Age: Female, sixty-seven years. **Clinical History:** Continued pain in the right hypochondrium for more than a year; very frequent hepatic colic, with jaundice and loss of flesh. **Actual Condition:** Slight jaundice; liver greatly increased in size. **Operation Notes:** June 3, 1892. Vertical lateral incision; gall-bladder small, the size of an English walnut; adheres to liver, transverse colon, and the duodenum; its incision reveals black mucous matter, no calculi, but cystic canal obliterated; cholecystectomy; common duct dilated to size of the finger; contains a movable stone, as large as an almond; removed by incision; catheterization of duct and suture of its walls with two rows of silk stitches; iodoform packing after cauterizing the cut end of the cystic duct. **Result:** Recovery; packing changed the fifth day; gives issue to liquid colored by the bile; fistula secretes but little the third day and closes completely on the twentieth day, when all jaundice had disappeared. Visited in December, 1892, her perfect health is noted.

No. 31. Surgeon: KEHR. Sex and Age: Female, fifty years. **Clinical History:** Hepatic colic for four years, for the last year and a half persistent jaundice; loss of weight (twenty pounds); nine months ago rapid diminishing of jaundice; stools again colored. **Actual Condition:** Chronic jaundice; liver greatly increased in size. **Operation Notes:** October 12, 1892. Vertical lateral incision; linguiform deformation of the inferior border of the liver; adhesion of the omentum to the small thickened gall-bladder; itself closely united to the duodenum, a fistula having formed, and existing between the two latter organs; this fistula is sectioned, the two openings sutured, and gall-bladder removed; two calculi in the common duct near to the duodenum; incision; removal of stones from the dilated duct; suture of the incision; hæmostatic forceps left on an injured vein; iodoform packing; operation lasts three hours. **Result:** Recovery; forceps removed fifth day; same day a colored stool; fistula closed at the end of a month; gain in weight of ten pounds; five weeks later the fistula reopens and persists. See this same case, No. 70, of these tables.

No. 32. Surgeon: MICHAUX. Sex and Age: Female, sixty-eight years. **Clinical History:** Persistent jaundice; loss of flesh. **Actual Condition:** Chronic jaundice. **Operation Notes:** September 14, 1894. Gall-bladder small, atrophied, and filled with calculi; during the dissection of the cystic duct a stone was felt in the supraduodenal portion of the common duct; all attempts to dislodge or crush it having failed, the cal-

culus was extracted by incision of the wall; catheterization and suture with four or five silk stitches; large rubber drain; iodoform packing. **Result:** Death forty-eight hours later; *post mortem* shows no trace of peritonitis; no septicæmia.

No. 33. Surgeon: MICHAUX. **Sex and Age:** Female, forty-three years. **Clinical History:** Intense jaundice which has persisted for eight or ten months. **Actual Condition:** Chronic jaundice; tumor in the region of the gall-bladder. **Operation Notes:** November 23, 1894. Vertical lateral incision; the gall-bladder about the size of the normal; the tumor felt in this region consists of the deformed liver; stone in the cystic duct, another in the supraduodenal portion of the common duct, the incision of which, after dissection of the gall-bladder, allows the extraction of two calculi, each as large as a hazel-nut; catheterization of the common duct which was dilated as large as the forefinger; ligature of the cystic, suture of the common duct with eight or ten stitches of fine silk; drainage of the subhepatic region; iodoform packing. **Result:** Recovery; flow of bile from the wound on the second day, which stops gradually, and ceases entirely in from fifteen to twenty days.

No. 34. Surgeon: SCHWARTZ. **Sex and Age:** Female, fifty-three years. **Clinical History:** Eight years ago the first hepatic colic without jaundice, but accompanied by pain for three months; since this time the hepatic colics have become more frequent and complicated with crises of biliary retention; loss of flesh; attack of fever every other day, the temperature reaching 100° and 102° F. **Actual Condition:** Chronic jaundice; liver not increased in size; gall-bladder cannot be felt by palpation; intermittent hepatic fever. **Operation Notes:** May 8, 1895. Vertical lateral incision; the gall-bladder hidden beneath the liver in a mass of adhesions, in which mass is found an abscess, in the supraduodenal portion of the common duct, as large as the extremity of the little finger; incision allows the extraction of this calculus and four other smaller ones; suture of the incision; large drain; iodoform packing. **Result:** Death forty-eight hours later; pulse rapid and cannot be counted; temperature never above 100° F.; *post mortem:* about a pint of bile in the right half of the abdomen; the sutures of the duct had held well; liver cirrhotic; peritoneum normal.

GROUP II.—CHOLEDOCHOTOMY ASSOCIATED WITH INTERVENTIONS ON

A.—THE GALL-BLADDER AND CYSTIC DUCT AT THE SAME TIME.

1. Cholecystectomy,—Nine Cases,—Nos. 26–34.

In these nine cases, the details of two of which have been communicated to us for publication and are here given *in extenso*, the gall-bladder was opened, and the calculi therein contained extracted either before or after the choledochotomy.

In general, the bladder was contracted to a very small volume, as in Cases XXVI., XXVIII., XXIX., XXX., XXXI., and XXXII. In Case XXXIV. it was found much smaller than the normal and hidden beneath the liver. Once the gall-bladder was noted larger than usual, Case XXXIII. Three times no calculi were contained in the bladder, Cases XXIX., XXX., XXXI.; and none of the reports mention its inflammatory condition. The history of Case XXXIV. alone describes a small abscess formed between the wall of the gall-bladder and the liver.

The different ways in which cholecystectomy has been used as a complement to the extraction of stone from the common duct are particularly interesting to study. A diagnosis of lithiasis, limited to the gall-bladder

or cystic duct, determines a cholecystectomy, but the liberation of the bladder or its extirpation reveals a calculous stenosis of the common duct, as in the cases of Kümmel and Studsgaard, who, after removing the gall-bladder, detected and removed the calculi from the common duct. Rehn, Schwartz, and twice Michaux discovered the stone of the common duct and removed it while engaged in the liberation of the cystic, which was excised later, determining the order of the operation thus: First, dissection of the gall-bladder and cystic duct, which exposes the common duct and shows its stenosis; second, choledochotomy; third, removal of the gall-bladder by section of the cystic duct. Michaux, reporting to the Société de Chirurgie de Paris, strongly recommends this order of procedure for all cases. Its value will be considered later in studying the *modus operandi*.

In the above cases the cholecystectomy was preferred, either as a useful operation for the treatment of lithiasis of the gall-bladder or cystic duct, or to serve as a guide to the common duct. But Roux and Kehr were forced to the same conduct, performing the excision of the gall-bladder by necessity. Roux reports that the constant tearing of the bladder beyond repair required its total excision. Kehr, on the other hand, cut through a cholecysto-duodenal fistula while dissecting the adhesions about the duodenum. Not being able to suture the opening into the gall-bladder on account of the extreme friability of its walls, or to use this opening for fixation in the abdominal wound, on account of the proximity to the cystic duct and consequent too great depth in the peritoneal cavity, in this case the operator could not do otherwise than ligate the cystic duct and remove the gall-bladder entirely. A condition of the bladder-walls so bad that their suture or use for the formation of a biliary fistula is impossible constitutes the only indication for the cholecystectomy.

Of the nine cases of this class three terminated fatally. The first death is reported by Kümmel, the patient dying of collapsus twenty hours after the operation, which was exceedingly long and difficult, especially so for the liberation of the gall-bladder. Remembering that this was the first operation of choledochotomy, preceding all others by five years, we can easily understand the length and difficulty of the intervention. Referring to this, Kümmel says that at that epoch the total extirpation of the gall-bladder was considered the good operation, which implies that at the present time the operator, under the same circumstances, recognizing the stone in the common duct, would not perform cholecystectomy. The second death comes from Michaux, Case XXXII. An aged woman, very feeble, permits the easy removal of the gall-bladder, but the evening of the next day the patient commenced to sink rapidly, and died in forty-eight hours without a trace of septic infection. She was probably a subject with advanced hepatic alterations that only a histological examination could have demonstrated. The third fatal termination occurred with no temperature above 100° F. The post-mortem showed a normal peritoneum, but in the abdominal cavity were found about five hundred grammes of bile, which was

surely septic, producing intermittent hepatic fever. The collection of this liquid took place in spite of iodoform packing and drainage.

CASE VII.—Communicated by Dr. Roux, Table No. 29. Calculi of the common duct; recurrent hepatic colic; incomplete biliary retention; choledochotomy; recovery.

Woman, aged forty-six, born in Switzerland, but having lived a long time in Asia Minor and in Mexico, whence she returned with hepatic colic and considerable hypertrophy of the liver and spleen, attributed largely to intermittent fever. For several years she suffered with exceedingly painful attacks of hepatic colic, during which she became regularly jaundiced, but to no intense degree and of no long duration. On the other hand, she suffered from chills and fever of periodic return during several days, a part of which symptoms should be charged to the paludic infection. Her stools were generally colored. During the crisis no jaundice was present, and even at other times was never intense. At these times the stools were less colored, but not entirely gray. During a troublesome period of attacks, in which the gastric difficulties predominated, the patient decided to demand surgical aid. The woman, being very fleshy, presented a considerable thickness of abdominal wall, which promised for this reason an intervention disagreeable, on account of the great depth of the field of operation.

Operation.—June 16, 1891.—Incision on the external border of the right rectus. The gall-bladder, greatly contracted and everywhere adherent, can only be brought into the abdominal wound piece by piece. The rigidity and friability of its walls made it impossible, although so small, to determine the presence or absence of calculi in the gall-bladder without incising it. The exploration by incision showed it empty. Nothing was found in the cystic or hepatic ducts; but in the common duct, near its termination, a series of stones could be felt as large as the extremity of the finger and with sharp edges. Every effort to dislodge or crush them failed, and, to tell the truth, these efforts were not insisted upon for fear that the sharp edges should cut the walls, themselves of no normal suppleness, as might be expected after the long retention of the calculi. A longitudinal incision (button-hole) allowed the extraction, with some difficulty, of four stones of equal size. Their tetrahedric shape explained the intensity of the pain felt during the crisis and the incomplete stenosis of the duct. The incision of the common duct was closed by suturing the mucous membrane with catgut and the other coats with fine silk. The friability of the gall-bladder necessitated its total extirpation, the suture of its walls being impossible. The cystic duct, after invagination of the mucous coat, was closed with sutures; iodoform packing and drainage. After the first dressing, and for several days, there was a slight flow of bile. The stools were colored. During the second week a violent access of intermittent fever, controlled by quinine in large doses. After this there was no more hepatic colic, and only a few febrile attacks of periodic nature, yielding rapidly to quinine. May 18, 1895, the patient is reported well satisfied with the operation, although a small hernia, the size of an egg, exists, which was developed at the site of the drain and packing, but which is scarcely recognizable on account of the quantity of fatty tissue that the patient still preserves.

CASE VIII.—Communicated by Dr. Schwartz, Table No. 34. Biliary lithiasis; hepatic colic; chronic jaundice; calculi in the common duct; choledochotomy and cholecystectomy; death.

Woman, A. C., aged fifty-three, entered the Hôpital Cochin April 11, 1895. Hereditary antecedents negative. Personal antecedents, typhoid fever at the age of nineteen, menstruation established at the age of sixteen, menopause when forty-eight years

old. She has had three children, all of whom are in good health. Eight years ago, after several days of digestive trouble, the patient was taken with severe pains in the right hypochondrium, pains which persisted constantly for three months, but were only intolerable for the first two days after their appearance, and were not accompanied by jaundice. Since the first accident the patient has had frequent crises of hepatic colic with biliary retention, and has lost flesh.

Actual Condition.—Chronic jaundice; discolored stools; pains in the right hypochondrium; no appetite. The liver does not seem to be of increased volume; its inferior border only descends as far as the ninth rib. The gall-bladder cannot be felt by palpation. The stomach appears to be dilated. Biliary pigments in the urine. Febrile attacks about every two days, which come on with fever and chills, the temperature rising to 102.5° F. and 103° F.; intermittent hepatic fever.

Operation.—May 8, 1895. Incision on the external border of the rectus. The gall-bladder is hidden beneath the inferior border of the liver, and between this organ and the bladder is found a small abscess. The gall-bladder is fixed by numerous adhesions very difficult to dissect. In the common duct is found a large calculus, of cylindrical form, as large as the extremity of the little finger, which is removed by incision of the common duct, and from this four other smaller stones are extracted. The walls of the canal are then sutured, and the gall-bladder excised, after ligating the cystic duct with a silk and a catgut thread. The section of the cystic is touched with the thermo-cautery. Drainage with three bands of iodoform gauze and a large rubber drain. The parietal wound sutured. The entire operation lasted one hour and five minutes. May 9, pulse rapid; cannot be counted. The temperature not above 100° F.; tranquil delirium; death, May 10, at 8 A.M.

Post-mortem.—The opening of the abdomen shows, to the right, a quantity of bile—about five hundred grammes—descending downward, to the right iliac fossa, and upward, filtering between the posterior edge of the liver and the diaphragm. The peritoneum shows traces neither of suppuration nor of congestion. All of the sutures of the common duct had held perfectly. The liver presents a normal volume of hard consistency, and its section shows the alterations of cirrhosis.

2. CHOLEDOCHOTOMY AND CHOLECYSTOTOMY. (11 Cases.)

No. 35. Surgeon: HEUSSNER. Sex and Age: Female, thirty-eight years. Clinical History: Hepatic colic for twenty-three years, becoming more and more violent, and for the last year intolerable; jaundice has existed several different times; for the last six weeks continued pain; loss of flesh. **Actual Condition:** Slight jaundice (stools not discolored); liver not increased in size; gall-bladder not perceptible. **Operation Notes:** June 6, 1889. Transverse incision under the edge of the liver; gall-bladder atrophied, size of a nut, adheres to the omentum and the stomach; incision of the bladder allows extraction of five calculi; cystic duct narrowed greatly; stone, as large as an English walnut, in the common duct near its termination; several others not so large; incision; removal of the calculus and eight small concretions; common duct greatly dilated; suture of the incision with difficulty accomplished by means of eight fine silk stitches; two rubber drains. **Result:** Recovery; critical condition for the first three days; abundant flow of bile from the drains, but diminishes; colored stool the fifth day; drain removed the ninth, and wound completely closed the thirteenth day.

No. 36. Surgeon: LLOYD. Sex and Age: Male, fifty-one years. Clinical History: First hepatic colic twenty-three years before, accompanied with jaundice in a slight degree; attacks became more and more frequent; loss of flesh; since entrance at hospital two attacks with chills and fever (103° F.); the jaundice increases. **Actual Condition:** Intense jaundice; liver not increased in size; gall-bladder not perceptible; fever. **Operation Notes:** January 24, 1890. Vertical lateral incision; colon adheres to the liver; gall-bladder, only found by long search, contracted and thickened; is incised; cystic duct obliterated; deep down in the duodenum stone is felt; incision directly upon

it allows extraction, and it is found to have been lodged in the common duct, so dilated that two fingers can be introduced into it; suture of the incision difficult on account of the depth; two glass drains. **Result:** *Death*, the third day, from shock; bile flowed from the drains on the second day; signs of congestion of the lungs, to which the patient succumbed.

No. 37. Surgeon: COURVOISIER. **Sex and Age:** Female, twenty-six years. **Clinical History:** Persistent jaundice for more than a year. **Actual Condition:** Intense jaundice; liver increased in size; gall-bladder not perceptible. **Operation Notes:** February 18, 1890. Ideal cholecystotomy, with removal of a stone as large as an English walnut; stone in the common duct near to the duodenum; numerous adhesions; incision of the duct with extraction of the calculus by pieces; four silk stitches to close the incision and a few others to reunite surrounding tissue; drainage. **Result:** Recovery; a little bile in the dressing on the second day, but never any more; colored stool the eighth day. Visited in May, the patient is noted in perfect health.

No. 38. Surgeon: CZERNY. **Sex and Age:** Female, forty-one years. **Clinical History:** Hepatic colic with jaundice five months ago; jaundice has since persisted with slight modifications. **Actual Condition:** Chronic jaundice; liver greatly increased in size; gall-bladder not perceptible. **Operation Notes:** August 1, 1893. Choledochotomy without lithectomy; cholecystotomy with removal of the calculi; transverse incision just above the navel completed by a vertical median supra-umbilical incision; gall-bladder greatly atrophied; common duct torn during the dissection of adhesions; very movable stone in common duct; incision of gall-bladder; removal of two calculi; after which every search for the stone in the duct fails to find it; catheterization; suture of the incision imperfectly accomplished with three stitches; gall-bladder closed; drain and iodoform packing. **Result:** Recovery; the bile flows from the wound in abundance, but rapidly diminishes; stool colored the fourteenth day. Visited fifteen months later the patient is noted completely cured and to have gained forty-four pounds in weight.

No. 39. Surgeon: JABOULAY. **Sex and Age:** Female, twenty-six years. **Clinical History:** Hepatic colic repeatedly, with jaundice, frequently very intense, and lasting from twenty to thirty days. **Actual Condition:** Slight jaundice. **Operation Notes:** August 20, 1893. Vertical lateral incision; gall-bladder contracted upon a stone; another in the common duct; incision; extraction; iodoform packing. **Result:** Recovery; packing removed the tenth day contained small calculi; fistula persisted ten months, but closed after the extraction of gauze forgotten in the wound. Visited April 17, 1895. Good health in spite of a little yellowing from time to time.

No. 40. Surgeon: CZERNY. **Sex and Age:** Male, thirty-two years. **Clinical History:** Pain five years ago; frequent hepatic colic for the last fifteen months; jaundice has persisted for thirteen months; fever. **Actual Condition:** Chronic jaundice; liver greatly increased in size; gall-bladder not perceptible. **Operation Notes:** January 16, 1894. The ileo-cæcal appendix adheres to the gall-bladder and is excised; median incision completed by a transverse; omentum adheres to the liver; gall-bladder atrophied; in the common duct, dilated to the size of the finger, is a stone which is removed through incision; stone size of a nut; catheterization; suture with two rows of silk stitches; gall-bladder closed; iodoform packing. **Result:** Recovery; packing removed the second day; no bile; the stools are colored. Two and a half months later the patient in excellent health.

No. 41. Surgeon: CZERNY. **Sex and Age:** Female, thirty years. **Clinical History:** Violent hepatic colic for six months, accompanied with jaundice; loss of twenty-five pounds in weight. **Actual Condition:** Chronic jaundice; liver increased in size; gall-bladder not perceptible. **Operation Notes:** May 4, 1894. Median incision completed with a transverse; atrophied gall-bladder, incised, evacuates purulent mucous matter; catheter passed by the cystic; stone in common duct near the duodenum; bleeding points tied; incision of duct; difficult extraction of calculus; suture with six silk stitches; gall-bladder closed; iodoform packing. **Result:** Recovery; packing removed the second day; jaundice disappears slowly; stools colored; gall-bladder remains slightly sensitive.

No. 42. Surgeon: CZERNY. Sex and Age: Female, forty-eight years. **Clinical History:** Nine years ago hepatic colic commenced without jaundice; for two years and a half continual pain; loss of flesh. **Actual Condition:** No jaundice; the edge of the liver slightly passes the costal border; gall-bladder not perceptible. **Operation Notes:** September 7, 1894. Transverse incision; gall-bladder, very small, is incised; evacuation of half a teaspoonful of purulent matter and two calculi; the friability of the wall necessitates the excision of an ulcerated, black-colored portion; a stone is found partly in the cystic and the rest in the common duct; incision of wall of the two ducts; hemorrhage; removal of calculus; two rows of stitches to close these incisions; cholecystotomy ideal; iodoform packing. **Result:** Recovery; the bile never flowed from the wound; packing removed the twelfth day; complete recovery at the end of four weeks.

No. 43. Surgeon: KÜSTER. Sex and Age: Female, sixty-two years. **Clinical History:** Infrequent attacks of hepatic colic for eighteen years, without jaundice; six weeks ago a violent attack, accompanied with chills and jaundice; a few days later a fistula opened above the umbilicus, giving issue to a yellow-colored liquid; patient jaundiced; stools discolored. **Actual Condition:** Intense jaundice; liver not increased in size; beneath it a tumor as large as the fist, following the respiratory movements. **Operation Notes:** July 30, 1891. Oblique incision below the costal arch; adhesion of the omentum to a lobe of the liver (deformed), representing the tumor before described; a cord as large as the little finger extends from the umbilicus to the gall-bladder, which is dilated; this fistula is excised after being tied at each extremity, and the cut ends after disinfection are sutured with catgut; from the bladder a large stone and portions of a second are removed; the finger finds a calculus in the common duct close to its termination in the duodenum; incision; strong hemorrhage; removal of the stone; two rows of sutures with catgut and supplementary silk stitches; suture of the gall-bladder; curetting of the cutaneous end of the fistula; iodoform packing. **Result:** Recovery; packing replaced by a drain on the fourth day; colored stool the sixth day; jaundice disappeared; fistula suppurated until disinfected and curetted in October, 1891. Visited one year later, a complete cure is reported.

No. 44. Surgeon: ANDERSON. Sex and Age: Female, thirty-four years. **Clinical History:** Hepatic colic for seven months, becoming more and more frequent, and accompanied with jaundice. **Actual Condition:** Jaundice; liver slightly increased in size. **Operation Notes:** February 25, 1893. Incision beneath the costal border; gall-bladder atrophied; its incision allows the extraction of a calculus lying in the opening of the cystic duct; stone in the first portion of the common duct extracted by incision; sutures of fine silk for gall-bladder and common duct; drainage with iodoform gauze. **Result:** Recovery; colored stool the fifth day; bile flowed from the drain during eight days; gauze removed the tenth day; two days later strong hemorrhage from the walls of the fistula. Jaundice totally gone in April.

No. 45. Surgeon: CZERNY. Sex and Age: Female, thirty-one years. **Clinical History:** During seven years five attacks of hepatic colic without jaundice; wandering right kidney; *nephrorrhaphy* May 30, 1893; wound healed June 6, 1893; during the month of June four attacks of hepatic colic without jaundice, but becoming more frequent; fever 101° to 103° F.; jaundice rapidly generalized July 8, 1893. **Actual Condition:** Recent jaundice; liver not increased in size; no more fever. **Operation Notes:** July 11, 1893. Median incision; adhesions of liver, omentum, and duodenum; small thickened gall-bladder; puncture and aspiration of clear liquid; incision shows absence of stone in the gall-bladder; calculus at the union of the hepatic and common ducts, which are not dilated; incision of the common duct allows extraction of stone as large as a pea; suture, two rows of stitches for common duct; suture of the gall-bladder and its intraparietal fixation; drainage with iodoform gauze. **Result:** Death the fourth day; colored stool on the second day; delirium, hallucinations, and weak pulse; the fourth day the temperature rose to 103.2° F.; *post-mortem* shows no signs of peritonitis nor of infection.

3. CHOLEDOCHOTOMY AND CHOLECYSTOSTOMY. (10 Cases.)

No. 46. Surgeon: THORNTON. Sex and Age: Female, forty years. Clinical History: For six years crises of pain every three or four months, lasting longer and becoming more violent for the last two years; jaundice has persisted for two months. **Actual Condition:** Intense jaundice; fever. **Operation Notes:** June 2, 1889. Incision of the gall-bladder; removal of a calculus lying in the cystic duct; stone at union of the cystic with the common duct; incision; fragmentation of calculus with a needle, but in spite of a long incision, impossible to evacuate the *débris* entirely; suture of the incision, completing the cholecystostomy; glass drain in the subhepatic region. **Result:** Recovery; biliary fistula closes on the sixteenth day; complete cure on the nineteenth day.

No. 47. Surgeon: RIEDEL. Sex and Age: Female, thirty-nine years. Clinical History: Hepatic colic for eight years; continual pain for two years and since spring of 1891; jaundice which persists; frequent crises; fever; loss of thirty pounds in weight. **Actual Condition:** Chronic jaundice; liver greatly increased in size; gall-bladder can be felt after anæsthesia. **Operation Notes:** July 18, 1891. Vertical lateral incision; gall-bladder passes the edge of the liver, a distance of three centimetres; fixation of bladder to abdominal wound; incision and extraction of calculi; a stone in the cystic duct is pushed back into the gall-bladder; calculus in the supraduodenal portion of the common duct; incision, extraction; suture with six stitches of fine silk; no drainage other than a drain left in the gall-bladder. **Result:** Recovery; biliary fistula, which ceases the following month. Visited in November, 1891; the excellent health of the patient is noted and a gain in weight of twenty-eight pounds.

No. 48. Surgeon: SUTTON. Sex and Age: Female, fifty-eight years. Clinical History: Hepatic colic with jaundice fifteen days before; she had previously had several attacks, followed by the expulsion of calculi in the stools; symptoms become more severe. **Actual Condition:** Jaundice; gall-bladder not perceptible. **Operation Notes:** September 18, 1891. Vertical lateral incision; omentum adheres to the liver and colon; gall-bladder exceedingly small; its incision allows extraction of four calculi; two stones in the common duct removed after its incision; adhesions form a natural isolation of the region from the peritoneal cavity; no sutures for duct or gall-bladder; drainage. **Result:** Recovery; bile flows from the drain; on the third day flow stops and pain reappears, together with an intense jaundice; these stop two days later; jaundice disappears the tenth day; drain removed on the sixteenth day. Visited in June, 1892; complete recovery.

No. 49. Surgeon: RIEDEL. Sex and Age: Female, thirty-one years. Clinical History: Hepatic colic for two years; jaundice continued for eight months; loss of flesh from one hundred and forty-three to one hundred and twenty-five pounds. **Actual Condition:** Chronic jaundice; liver greatly increased in size; gall-bladder not perceptible. **Operation Notes:** October 2, 1891. Median incision; gall-bladder very small, size of a nut; adhesions of the omentum, colon, and stomach; stone in the supraduodenal portion of the common duct; excision and extraction of two large calculi and two smaller ones; hemorrhage from the wall of the common duct, dilated to the size of the thumb; fixation and incision of gall-bladder; incision of common duct closed with silk; no drainage other than the drain left in the gall-bladder, which contained no stone. **Result:** Recovery; the flow of the bile from the gall-bladder, at first abundant, ceased the fifth day; peritoneal reaction; drain found obliterated by coagulated blood, same also in gall-bladder, which is evacuated; bile flows again and stops permanently later. Visited in January, 1892; excellent health; patient has gained twenty-five pounds.

No. 50. Surgeon: RIEDEL. Sex and Age: Female, forty-one years. Clinical History: Hepatic colic without jaundice for two years; in November, 1891, colic, accompanied by jaundice, fever, and continued pain. **Actual Condition:** Jaundice; liver not increased in size; gall-bladder not appreciable; no fever. **Operation Notes:** December 12, 1891. Transverse incision of the right rectus; gall-bladder, the size of a small apple, adheres to the transverse colon and stomach; cystic duct dilated; in the supraduodenal

portion of the common duct, which is as large as the little finger, is a stone; incision and removal; strong hemorrhage; suture with two rows of fine silk; fixation of the gall-bladder and incision; no drainage. **Result:** Death the fourth day; peritonitis; bile in the abdomen; the suture which fixed the gall-bladder to the edges of the parietal wound had not held for the inferior portion; walls of cystic and common ducts ulcerated.

No. 51. Surgeon: LAUENSTEIN. **Sex and Age:** Female, thirty-four years. **Clinical History:** Frequent hepatic colic for three months, followed by jaundice, fever, and pain, which became continuous. **Actual Condition:** Intense jaundice; liver increased in size; gall-bladder not perceptible; fever, 103° F. **Operation Notes:** June 2, 1892. Vertical lateral incision; omentum adheres to the liver, of which the linguiform deformation is noted; gall-bladder small and contracted to size of a plum; stones in the supra-duodenal portion of the common duct; incision between thread loops; removal of three calculi; dilated duct as large as the finger; suture with two rows of catgut stitches; incision of the gall-bladder; evacuation of pus and a stone; bladder left open; iodoform packing. **Result:** Recovery; febrile symptoms for the first six days; colored stool seventh day; packing removed twelfth day; recovery complete on the twenty-fifth day.

No. 52. Surgeon: KÖRTE. **Sex and Age:** Female (?). **Clinical History:** Severe accidents of biliary lithiasis. **Operation Notes:** April, 1893. Extraction from the gall-bladder of one very large stone and numerous small calculi; stone in the common duct; incision; removal; suture; drain left in the gall-bladder; drainage-tube and iodoform packing. **Result:** Recovery; drain removed on the eighth day; gall-bladder closed by a secondary suture.

No. 53. Surgeon: LAUENSTEIN. **Sex and Age:** Female, fifty years. **Clinical History:** Intense jaundice for five months; fever. **Actual Condition:** Chronic jaundice; liver greatly increased in size; gall-bladder not perceptible; fever 102° to 103° F. at night. **Operation Notes:** July 30, 1893. Vertical lateral incision completed by a transverse; bile flows from the abdomen, thick and mixed with pus; adhesions between the gall-bladder, omentum, colon, and transverse mesocolon; removal of a stone from the common duct; suture and iodoform packing. **Result:** Death the following night; no *post-mortem*; probably shock.

No. 54. Surgeon: LAUENSTEIN. **Sex and Age:** Female, sixty-three years. **Clinical History:** Hepatic colic with jaundice for the last two years. **Actual Condition:** Slight jaundice; stools very slightly colored; liver increased in size; gall-bladder not perceptible. **Operation Notes:** November 11, 1893. Vertical lateral incision; linguiform deformation of the liver; gall-bladder small and thickened; adhesions with the omentum and duodenum; incision of gall-bladder which contains bile, but no stones; two calculi in the common duct extracted by incision between two thread loops; hemorrhage; suture with three rows of stitches; iodoform packing. **Result:** Death the fourth day; peritonitis, pus mixed with bile in the abdomen; a stone had been left in the hepatic duct.

No. 55. Surgeon: KEHR. **Sex and Age:** Female, forty-eight years. **Clinical History:** Jaundice persisting for ten years, with slight variations in intensity, more severe the last four years; hepatic colic. **Actual Condition:** Intense jaundice; liver slightly increased in size; gall-bladder not perceptible. **Operation Notes:** February 26, 1894. Vertical lateral incision; adhesions to the liver and parietal peritoneum; abscess in the midst of these adhesions is cleaned out; gall-bladder atrophied, the size of a cherry, adhering to omentum and colon, is opened and three stones removed; calculus taken from the cystic, another from the common, and four from the hepatic ducts; suture of the common duct very difficult; iodoform packing. **Result:** Recovery; colored stool on the second day; abundant flow of bile from the fistula; a double pulmonary congestion causes much anxiety for a week; complete cicatrization the tenth day; jaundice disappears.

GROUP II., B.—THE CYSTIC DUCT ONLY.—CHOLEDOCHOTOMY AND CYSTICOTOMY. (1 Case.)

No. 56. Surgeon: HOCHENEGB. **Sex and Age:** Female, forty-six years. **Clinical History:** Hepatic colic for three and a half years; followed each time by jaundice; loss

of flesh. **Actual Condition:** Jaundice; liver increased in size; gall-bladder not perceptible. **Operation Notes:** December 21, 1890. Incision on the costal border; gall-bladder contracted and small; hard stones at the origin of the cystic and in the common ducts; incision and extraction of three calculi; no sutures on account of the great depth; iodoform packing. **Result:** Recovery; no fever; flow of bile from the wound during six weeks; fistula cured nine months after operation. Visited at the end of 1891. Hernia at the union of the three branches of the abdominal incision.

GROUP II., A.

2. *Cholecystotomy*,—*Eleven Cases*,—*Nos. 35-45*.

Eleven times, the surgeon, having opened the gall-bladder for the extraction of calculi, mucous matter, or even pus, closed the incision with sutures some time before passing to the intervention on the common duct, but more frequently a temporary closing of the incision, or the packing of the bladder with gauze, permitted the choledochotomy and the termination of the operation by the suture of the incision of the gall-bladder, always found contracted, with the exception of Case XLIII., where a biliary fistula existed before. The cystic duct is noted permeable in Cases XLI. and XLVI., obliterated in Cases XXXV. and XXXVI.; its condition is not mentioned in the other reports. The cholecystotomy was generally ideal, performed on a gall-bladder of small dimension. After reducing the sutured bladder into the abdomen an iodoform packing was established as far as the common duct at the site of its incision. Czerny strongly recommends the combination of this simple cholecystotomy with choledochotomy, and in the five cases reported by him it will be noted that the presence of pus, twice found in the gall-bladder, did not influence a change of procedure. These cases merit consideration. In Case XLI., after ideal cholecystotomy, purulent matter being reported in the gall-bladder, the recovery was uninterrupted, but the jaundice disappeared very slowly, and the region of the gall-bladder remained painful. Mermann, the reporter of this case, declares that it is probable that the persistence of the jaundice and the pain were the consequence of the non-drainage of the gall-ducts and the continuance of the cholecystitis. A temporary fistula would have allowed a more rapid and complete recovery. Here a cholecystostomy would have been more useful and safer than the immediate closing of the gall-bladder. This operation was the more indicated as a catheterization had already demonstrated the permeability of the cystic duct. The next case, XLII., is also noteworthy. Careful reading of the report shows that it is rather a cysticotomy than a choledochotomy. The stone itself lay more in the cystic than in the common duct; moreover, no gall escaped upon the packing, which would also indicate that the intervention interested the common duct only slightly. The gall-bladder was filled with thick pus; the bad condition of its walls necessitating a partial excision before that their suture could be attempted. The patient recovered perfectly, which constitutes a strong argument for this procedure in spite of the theoretical objections that might be made, and a strong preference for cholecystectomy for cases of this sort, the common duct impermeable and

the gall-bladder a seat of suppuration with friable walls. Once the appendix vermiformis is noted in abnormal position, unusually long, and included in the adherent mass about the gall-bladder, Case XL.; a point to remember, as an inopportune section of the appendix would be very easily made during the dissection of the adhesion, and might become the source of peritoneal infection.

Two deaths are found in this group, the first from pulmonary congestion in no way affecting the choledochotomy, Case XXXVI. The second fatal result is attributed by the surgeon to cholæmia, but it is to be remarked that the patient had only been jaundiced for three days before the operation, and the same day had a colored stool. The third day after the intervention the temperature rose to 105° F., suggesting peritonitis, of which, however, the *post-mortem* revealed no trace.

A report of one case of this group has been put into our hands for publication.

CASE IX.—Communicated by Dr. Jaboulay; Table No. 39. Biliary lithiasis; recurrent jaundice; atrophied gall-bladder, containing a calculus; stone in the common duct; choledochotomy; recovery and definitive amelioration.

Mme. G., aged twenty-six, has had jaundice several different times, lasting from two weeks to a month, of great intensity and sometimes accompanied by vomiting to such a degree that a tumor of the stomach was thought of, which seemed the more probable on account of a hardness to be detected in the vicinity of the right rectum. Hæmatemesis, on the arrival of the patient at Vichy during a period of intense jaundice. Icteric condition not pronounced at the moment of operation, August 20, 1893. Vertical incision on the external border of the right rectus, exactly where an induration is felt, simulating the inferior edge of the liver perfectly. The gall-bladder was found shrivelled up upon a calculus, and a stone was also felt in the common duct, the incision of which allowed the extraction of the obstructing body. Packing with iodoform gauze, which was removed ten days later and in which numerous small calculi were found.

The patient returned to her home, but suffered with a painful biliary fistula. Ten months after the operation, the family physician found an extremity of a gauze band protruding from the orifice of the fistula, which had been overlooked at the time of removing the packing; the removal of this band left the fistulous opening in condition to heal rapidly, and, April 7, 1895, the closing of the fistula and general good health of the patient are reported. A slight trace of jaundice appears from time to time, and the woman complains of difficulty in straightening her back, but otherwise her condition is vastly improved.

GROUP II., A.

3. Cholecystostomy,—Ten Cases,—Nos. 46–55.

Of the ten cases of this class, two have been communicated to us by Dr. Lauenstein, of Hamburg, and are here published.

With two exceptions, in this series, the open gall-bladder was stitched in the abdominal wound. In order that this procedure may be possible and

useful there are two primordial conditions to be fulfilled: first, that the volume of the gall-bladder and the state of its walls be good enough to make the operation practicable; second, that the cystic duct be permeable. But it is remarkable that in this series of operations the gall-bladder, instead of normal size or dilated, is noted as contracted to the volume of a cherry, 55; a walnut, 49; the extremity of the little finger, 50 and 54; and a hen's egg, 47. An exception, Case LIII., notes the bladder as large; but here it was hidden beneath the liver, and its walls were twice perforated. Only once did the gall-bladder project beyond the edge of the liver. In Sutton's case the bladder was extremely contracted, and its incision, like that of the common duct, was left unstitched, the region being isolated from the abdominal cavity by adhesions, and a single drainage-tube was left in the wound. In Lauenstein's case the retracted gall-bladder, after incision and evacuation of the pus, was left open without further attention than an iodoform packing. The patient showed some febrile symptoms for the six days following the operation, but otherwise progressed favorably. The two preceding cases cannot properly be called cholecystostomies, for the incised gall-bladder was not stitched in the abdominal wound. Moreover, there is no evidence that the cystic duct remained permeable.

In this group, the fixation of the gall-bladder in the abdominal incision was accomplished after the termination of the choledochotomy, exception being taken for the two cases of Riedel, XLVII. and XLIX., who, before opening, sutured the bladder to the parietal wall. All other operators joined to the cholecystostomy, with its drainage of the bile, a second drain, constituted by a gauze packing of the region of the incised common duct. One of the three fatal cases of this group, L., is directly to be attributed to neglect to pack and drain the subhepatic region. The post-mortem demonstrated the insufficient fixation of the gall-bladder to the abdominal wall, its inferior portion communicated with the peritoneal cavity, and, besides, it was found that the sutures had not held in the friable walls of the common duct. That the drainage of the bile by the cholecystostomy was inefficacious is shown by the fact that the dressing of the abdominal wound, changed forty-five hours after operation, contained no trace of bile. The second death, Case LIV., was also due to peritonitis, caused by the escape of a small quantity of bile into the peritoneum. The iodoform packing and the sutures of the common duct found in good condition, render it probable that the escape of the infectious liquid occurred before or during the operation. The third death, Case LIII., also reported by Lauenstein, was the result of an intervention under exceedingly bad conditions. The incision of the abdomen gave issue to a thick liquid, a mixture of bile and pus. The examination of the gall-bladder showed it perforated in two places. The operation, though terminated in three-quarters of an hour, did not succeed in saving the patient, who died during the night. This result, due to shock or perhaps to a most acute infection, brings up the question, whether in a case of this sort it would not be better to perform

only the operation of necessity, the opening and cleaning of the gall-bladder, with the creation of a biliary fistula, reserving the liberation of the common duct for a better general condition of the patient, and then performing a secondary choledochotomy.

CASE X.—Communicated by Dr. Lauenstein, Table No. 53. Chronic jaundice; calculus in the common duct; suppurative cholecystitis and perforation of the gall-bladder; exudate of bile and pus in the region beneath the liver; choledochotomy and cholecystostomy; death.

Woman, aged fifty, operated July 30, 1893. Very much jaundiced for the last five months. Complete decoloration of the stools; tongue dry. Evening temperature reaching 100.7° F. and 103.4° F.

Operation.—Vertical incision on the external border of the right rectus. The opening of the abdominal cavity gives issue to a thick liquid, mixed pus and bile. The transverse colon in this region is covered with deposits of fibrin, the membrane stained by the gall. The edge of the liver is exposed by the incision, but the preliminary examination fails to discover the gall-bladder, which is finally found hidden beneath the liver, somewhat displaced to the left, and fixed in the midst of the mass formed by the adhesion of the omentum near the superior surface of the transverse meso-colon. The gall-bladder, long and large, is found to be perforated in two places near its fundus, and from these apertures is issuing the dark-colored bile. To stop the exit of this liquid the bladder is packed with sterilized gauze. An examination of the biliary canals reveals a large stone in the common duct. After placing two thread loops to serve in maintaining the edges, the wall of the duct is incised longitudinally between the loops, and a round stone about two-thirds of an inch in diameter is extracted. In order to work upon the common duct, it had been necessary to enlarge the abdominal incision by the transverse section of the rectus. The fistulous gall-bladder was sewn into the superior angle of the parietal incision, the rest of which was then closed. The entire operation lasted three-quarters of an hour. Death during the night.

CASE XI.—Communicated by Dr. Lauenstein, Table No. 54. Calculi in the common duct; choledochotomy and cholecystostomy; death.

Woman, aged sixty-three. For two years she has suffered from pain in the stomach and from hepatic colic, which lately became very violent. An attack, which lasted two days, was accompanied by jaundice. The volume of the liver had notably increased. Pressure in the region of the gall-bladder was painful, but a sensation of diffuse resistance was not obtained. The stools were only slightly colored by the bile.

Operation.—November 11, 1893. A long incision on the external border of the rectus exposes the pylorus and the duodenum. The border of the liver presents an irregular contour, with a tongue-like appendage, half a hand's breadth in length, atrophied and adherent to the omentum. The gall-bladder, small and thickened, adheres to the duodenum and to the omentum. To the left of the bladder, deep down on the posterior wall of the abdomen, two calculi can be distinctly felt. The gall-bladder is then opened; its walls three to four millimetres thick, but no calculi are found in the bile therein contained. The bladder is so small that it can scarcely lodge the extremity of the little finger. The cystic duct, itself contracted and short, contains no stone. The gall-bladder is now packed with gauze and pushed into the upper part of the wound. Two loops of thread are put into the walls of the dilated common duct, and between these two loops the canal is incised, which immediately

allows the flow of a large quantity of bile. With the aid of a curette two calculi of oval form, with small facets, and about fourteen millimetres in diameter, are removed. A severe hemorrhage occurs in the inferior angle of the incision into the common duct, but is stopped by the suture of the walls of the canal. This is done with an overhand running stitch, reinforced by two suture knots formed by tying together the ends of the threads used as loops, and over these three catgut sutures are placed. A packing of iodoform gauze is introduced as far as the suture-line. The open gall-bladder being fixed in the superior angle of the wound, the rest of the abdominal incision is closed.

November 13. The high temperature decides the inspection of the dressing, the changing of which allows the escape of a large quantity of bile from the gall-bladder. The wound shows signs of suppuration. The abdomen distended; vomiting. Death at noon, November 14.

Post-mortem.—The abdominal cavity contains a small quantity of pus mixed with bile. The stomach and intestine are greatly dilated. The suture of the common duct is found in good condition. The hepatic duct, dilated, as is the common duct, contains a stone as large as those extracted from the latter canal.

GROUP II.

B.—THE CYSTIC DUCT ONLY—CYSTICOTOMY, ONE CASE, TABLE NO. 56.

Only one case of this class has been found by our researches. Its existence as unique may authorize its summarization here.

Published by Dr. Hochenegg in the *Wiener klinische Wochenschrift*, 1891, p. 960. Jaundice; calculi in the cystic and common ducts; cysticotomy and choledochotomy; recovery.

Woman, aged forty-six. Hepatic colic for the last three years and a half, each time accompanied by jaundice. She has lost considerable flesh.

Actual Condition.—Greatly jaundiced; liver enlarged; gall-bladder not perceptible.

Operation.—December 21, 1890. Incision along the border of the right costal arch, and a second incision perpendicular to the first. Gall-bladder greatly contracted and irregular. Hard calculi at the origin of the cystic and in the common duct. Every attempt to displace or crush them failed. Incision directly upon the calculi permitted the extraction of three stones. The left hand introduced into the foramen of Winslow aided in raising up the canal. On account of the great depth the incisions of the ducts were not sutured. Packing with iodoform gauze. Recovery. No fever. For six weeks the bile continued to flow, but two months later the fistula closed completely. At the end of 1891 the patient was visited and found in good health, though a hernia is noted to have formed at the point of union of the three branches of the original incision.

GROUP III. A.—CHOLEDOCHOTOMY SECONDARY TO ANOTHER OPERATION ON THE GALL-BLADDER OR CYSTIC DUCT.

1. CHOLEDOCHOTOMY AFTER CHOLECYSTOSTOMY. (8 Cases.)

No. 57. Surgeon: KEHR. Sex and Age: Female, forty-eight years. Clinical History: Hepatic colic for five years. First Intervention: October 22, 1890. Cholecystostomy. Result: Complete biliary fistula. Operation Notes: December 28, 1890. The fistula kept open; strong adhesions in the region of the common duct, in which a stone is felt; incision and extraction of three calculi; catheterization and drainage. Result: Recovery; colored stool on the sixth day and the biliary fistula closes rapidly.

No. 58. Surgeon: RIEDEL. Sex and Age: Female, thirty-seven years. Clinical

History: Hepatic colic for a year and a half; for six months persistent jaundice, chills and fever; loss of flesh; liver increased in size. **First Intervention:** March 7, 1891. Cholecystostomy by two interventions; gall-bladder small; palpation reveals no calculi. March 21, bladder fixed to parietal wall and opened; one stone removed; sero-purulent liquid evacuated. **Result:** fistula secreting only mucous matter; accidents persist; cystic duct impermeable. **Operation Notes:** May 28, 1891. Vertical lateral incision; gall-bladder temporarily closed; adhesions between it and the colon and stomach; dissection causes a perforation of the colon, then of the gall-bladder, and finally of the stomach; suture of these perforations; common duct dilated to size of finger; contains stone; removed by incision; strong hemorrhage; suture with fine silk; gall-bladder reopened; no drainage of the wound. **Result:** Recovery; colored stool the eighth day; fistula closed in September; liver remained large 'for some time. Visited in January, 1892; excellent health; gain of thirty pounds in weight.

No. 59. Surgeon: KEHR. Sex and Age: Female, thirty-four years. **Clinical History:** Frequent attacks of hepatic colic for five years, followed by jaundice, lasting five weeks; liver increased in size, as also the gall-bladder. **First Intervention:** October 22, 1890. Cholecystostomy; incision parallel to the costal arch; exploration of the common duct difficult on account of adhesions; fifteen calculi extracted from the gall-bladder. **Result:** Complete biliary fistula. **Operation Notes:** July 28, 1891. Incision as for first intervention completed by a median section; numerous adhesions; three stones in the common duct removed by incision; suture with six silk stitches in two rows; no drainage. **Result:** Recovered; colored stool the sixth day; fistula closed spontaneously. Visited in January, 1893; complete recovery.

No. 60. Surgeon: KEHR. Sex and Age: Female, fifty-two years. **Clinical History:** Hepatic colic for ten years; jaundice for a year and a half, now very intense; liver greatly increased in size; gall-bladder not perceptible. **First Intervention:** April 14, 1892. Cholecystostomy; incision of average-sized gall-bladder; numerous calculi removed; palpation of common duct negative; fever ceases; pulse 72; some vomiting, attributed to adhesions between gall-bladder and duodenum. **Result:** Complete biliary fistula. **Operation Notes:** April 18, 1892. Median incision to liberate supposed adhesions; during their dissection a stone is found in the common duct and removed by incision; suture in two rows of stitches; no drainage. **Result:** death in collapsus some hours after the second operation; no post-mortem.

No. 61. Surgeon: KEHR. Sex and Age: Female, forty-seven years. **Clinical History:** First hepatic colic twenty years ago; two years ago a second attack, very violent; fever and passing jaundice; no jaundice; gall-bladder painful; fever. **First Intervention:** June 13, 1892. Cholecystostomy; adhesion of omentum to gall-bladder, the puncture of which lets out thick pus; incision; removal of fifteen calculi; not to infect the wound the exploration of the cystic duct is neglected. **Result:** Fistula secreting only mucous matter becomes later a complete biliary fistula (passage of stone from cystic into common duct). **Operation Notes:** April 27, 1893. Median incision supplemented by a transverse to the fistula; numerous adhesions; stone in the common duct removed by incision; sutured with eight fine silk stitches; dilatation of fistula, in which a drain is left; no other drainage. **Result:** Recovery; slight peritoneal reaction; colored stool on the fifth day; biliary fistula closed rapidly. Visited two months later; excellent health.

No. 62. Surgeon: ELLIOTT. Sex and Age: Female, thirty-nine years. **Clinical History:** Hepatic colic for fifteen years; more frequent last two years; recent jaundice. **First Intervention:** February, 1893. Cholecystostomy; dilated gall-bladder evacuates three pints of bile and twenty stones. **Result:** Complete biliary fistula. **Operation Notes:** May 22, 1893. Vertical lateral incision; in common duct, near duodenum, is a large stone; dissection of adhesions of duodenum to common duct; incision and extraction of stone as large as a pigeon's egg and other smaller ones from the dilated duct as large as the finger; suture with silk; iodoform packing. **Result:** Recovery; colored stool on the eighth day; fistula closes slowly; patient leaves the hospital in August, 1893.

No. 63. Surgeon: KEHR. Sex and Age: Female, thirty-seven years. **Clinical**

History: Hepatic colic for five years without jaundice; new attack with jaundice in July, 1893. **First Intervention:** July 13, 1893. Cholecystostomy with removal of fifty-four calculi; attempt to close the fistula in September without success. **Result:** Complete biliary fistula. **Operation Notes:** September 16, 1893. Removal of a small stone from the common duct, lying near to the duodenum. **Result:** Recovery; the fistula closed entirely in fifty-two days.

No. 64. Surgeon: KEHR. **Sex and Age:** Female, fifty-five years. **Clinical History:** Hepatic colic for several years. December 1, acute accidents of cholecystitis and calculous angiocholitis; chills, fever, jaundice, and pain. December 3, temperature 105° F. **First Intervention:** December 3, 1893. Emergency cholecystostomy; removal of calculi, by incision, from gall-bladder and cystic duct; gradual amelioration, and eight days later all danger is passed; attempt to close fistula remains unsuccessful. **Result:** Complete biliary fistula. **Operation Notes:** February 20, 1894. Median incision with a second transversal; adhesions; after long exploration stone found in the common duct; incision; removal; catheterization; two other stones removed from common and one from hepatic duct; two rows of sutures; drain left in fistula; no other drainage. **Result:** Recovery; no fever; fistula closes three weeks later; complete cicatrization.

2. CHOLEDOCHOTOMY AFTER CHOLECYSTOTOMY. (1 Case.)

No. 65. Surgeon: KÜMMEL. **Sex and Age:** Female, twenty-six years. **Clinical History:** Typhoid fever and hepatic colic in 1892. **First Intervention:** April, 1893. Cholecystostomy; fixation, incision, and removal of one hundred and forty calculi; gall-bladder closed at once and fixed to the skin; small fistula persists. **Result:** Intermittent biliary fistula. **Operation Notes:** December 5, 1893. Stone in the common duct as large as a pea; incision; removal; suture. **Result:** Recovery.

3. CHOLEDOCHOTOMY AFTER CHOLECYSTECTOMY. (1 Case.)

No. 66. Surgeon: TERRIER. **Sex and Age:** Female, fifty-five years. **Clinical History:** Hepatic colic without jaundice in June, 1891. In July, 1892, pain in the right hypochondrium. In December, 1892, jaundice appears and persists; chronic jaundice; liver increased in size; near to the middle of the inferior edge is a round mass, perhaps the gall-bladder (linguiform deformation). **First Intervention:** May 9, 1893. Cholecystectomy; vertical lateral incision; inferior edge of the liver thick and round; gall-bladder small, gray, and adheres to surrounding organs; dissection of bladder; removal of stone, as large as a walnut, lying partly in the cystic duct; no calculus is felt in the common duct. May 12, bile flows from the drain in the wound; biliary fistula of intermittent functions; jaundice persists. **Result:** Biliary fistula persists, as also the jaundice. **Operation Notes:** January 11, 1894. Colon adheres to the liver; stone in the common duct behind the first portion of the duodenum which cannot be displaced downward; duodenotomy, then incision of the common duct; extraction of the calculus; catheterization; suture of duct incision with three silk stitches, of the duodenum with two rows of Lembert sutures; drainage with a rubber tube and two slips of gauze. **Result:** Recovery; drain removed the second day; colored stool the fifth day; bile flows from drain on seventh day, but stops five days later; complete cure on February 14, 1894. Visited in July, 1895; found in good health.

GROUP III.—CHOLEDOCHOTOMY SECONDARY TO ANOTHER OPERATION ON

A.—THE GALL-BLADDER OR THE CYSTIC DUCT.

1. Cholecystostomy,—Eight Cases,—Nos. 57–64.

In this group the choledochotomy was a second operation performed to cure the biliary fistula, which the persistent obstruction of the common duct by calculus maintained *in statu quo*. This fistula was the result of the

first intervention, limited to the gall-bladder, seven times by cholecystotomy, once by spontaneous production after cholecystotomy, Group III., A, 2, and again in the same way after cholecystectomy, Group III., A, 3. A prerequisite to the preliminary cholecystotomy is manifestly to have a gall-bladder of sufficient size, but only once do we find it noted as greatly dilated, LXII., once slightly dilated, LIX. Cases LX., LXI., LXIII., LXIV., and LXV. report only ordinary size. Case LVIII. notes the smallness of the gall-bladder, and in Case LXVI. its smallness and friability necessitated its extirpation.

The limitation of the preliminary intervention to the gall-bladder is frequently an emergency measure, as that of Kehr, LXIV., performing an immediate cholecystotomy for the relief of acute cholecystitis with angiocholitis, with a temperature of 104° F., chills and jaundice. The extraction of a calculus from the cystic duct, with the consequent suture of the open gall-bladder in the incision of the abdominal wall, facilitated the complete drainage of the biliary ducts, stopped the accidents due to infection, and allowed the amelioration of the general condition of the patient. Two months and a half later the persistence of the fistula and the discoloration of the stools showed the complete stenosis of the common duct. At this moment a choledochotomy, performed under good conditions, succeeded perfectly in restoring the normal flow of the bile and a return to normal condition. Elliott likewise limited the first intervention to that of cholecystotomy, preferring to defer the choledochotomy for a better general condition of the patient. Three times the preliminary operation was done because the palpation of the common duct was impracticable (LVIII.), or failed to reveal a calculous obstruction, LX. and LXVI. In general, the first intervention results in establishing a permanent biliary fistula, the alleviation of accidents of infectious origin, and the disappearance of the jaundice, but the stools remain discolored,—Cases LVII., LIX., LXI., LXII., LXIII., and LXIV. Sometimes the fistula intermits in its functions (LXV.), and in other cases (LXVI.) a slight jaundice persists, together with the discoloration of the stools. In Case LVIII. the cystic canal having been left obstructed by the calculus, at the time of performing cholecystectomy in two sittings, only rendered possible a mucous fistula, the retention of the gall being in no way affected by the operation.

When performing the secondary choledochotomy, the biliary fistula may be totally disregarded and left intact; if detached from the abdominal wall during the operation, its fistulous opening may be re-established at the end of the intervention. The fistula almost invariably closes after the restoration of the permeability of the common duct. This closing may be hastened, as in Case LXVI., by the curetting of the fistulous opening.

Of ten cases of choledochotomy consecutive to the establishment of a biliary fistula, only one terminated fatally, a mortality far removed from that of the group of simple choledochotomy. The fatal case is reported by Kehr. Four days after a first operation, during which the negative results

of palpation of the common duct decided a limit of the intervention to that of cholecystostomy, Kehr reopened the abdomen in order to destroy the adhesions suspected to exist between the gall-bladder and the duodenum, and considered by the surgeon to be the cause of the uncontrollable vomiting. The dissection of these adhesions allowed a better examination of the common duct, and the discovery of a calculus therein determined an immediate choledochotomy. This second operation, performed four days after the first, and lasting two hours, left the patient the victim of a rapidly fatal collapse. The continual vomiting since the first intervention doubtless contributed its part to determine the fatal end. The last four cases of this group are extremely interesting, the choledochotomy here being consecutive to successive operations on the gall-bladder, on the common duct, or simultaneously on the bladder and common duct. In a case of chronic jaundice Mayo Robson performed a cholecystostomy to cure the persisting biliary fistula; he then made a visceral anastomosis of the cystic duct with the colon; but the reappearance of the jaundice four months after this cysticocolostomy necessitated another intervention, in the course of which the anastomosis was found reduced to an impermeable band; the cutting of this left a perforation of the colon, which was not detected during the operation, and caused a fatal peritonitis. The perforation of the colon during the dissection of adhesions has already been signalled in preceding cases, and its danger should be carefully remembered during that part of the operation. Mayo Robson's case has been communicated to us for publication, and is given below.

CASE XII.—Communicated by Dr. Kümmel, Case LXV. Calculi in the gall-bladder and in the common duct; cholecystostomy; removal of one hundred and forty calculi from the gall-bladder; persistent fistula; choledochotomy eight months later; extraction of a stone from the common duct; recovery.

Woman, aged twenty-six, had typhoid fever in 1892, and at the same time suffered with hepatic colic. A cholecystostomy was made in April, 1893, with extraction of one hundred and forty calculi contained in the gall-bladder. Some of the stones were small, but others were of considerable size. The operation was performed in the usual way,—liberation of the bladder, suture of its walls to the peritoneum and muscular layer with a running thread,—thus exposing a bladder surface as large as a quarter of a dollar. The gall-bladder was then opened, its contents extracted, and the incision immediately closed with catgut sutures, and the skin then drawn over the wound and sewn. With the exception of a small fistula, that soon closed, the wound healed rapidly; but the fistula soon reopened, and continued to secrete. The patient continued to suffer, although the gall-bladder contained no more stones. December 5, 1893, the abdomen was reopened, and a stone as large as a pea was found firmly encysted in the common duct. Incision of this canal, extraction of the calculus, and suture of the wound of the duct, after which the abdomen was closed. Recovery without incident, and since that time the patient has enjoyed excellent health. In May, 1895, she is reported as being in good condition, never having had any further trouble.

4. CYSTICO-ENTEROSTOMY. (1 Case.)

No. 67. Surgeon: ROBSON. **Sex and Age:** Male, thirty-seven years. **Clinical History:** Chronic jaundice. **First Intervention:** I. March, 1892. Cholecystostomy; calculi removed from gall-bladder and from cystic duct; biliary fistula persists. II. August, 1892. Cystico-colostomy; temporary cure. December, 1892, the jaundice reappears. **Operation Notes:** January 28, 1893. The cystico-colic anastomosis so shrivelled as to be impermeable, and is, therefore, excised; numerous adhesions; large stone extracted from the common duct by incision; suture and drain. **Result:** Death from peritonitis; this spot of the colon which had anastomosed with the gall-duct had allowed the formation of stercoral perforation.

CASE XIII.—Communicated by Dr. Mayo Robson, Case LXVII. Chronic jaundice; cholecystostomy; persistent biliary fistula; cystico-colostomy; reappearance of jaundice after four months; choledochotomy; extraction of a large calculus from the common duct; death.

Man, aged thirty-seven. A cholecystostomy was made in March, 1892, to alleviate pronounced jaundice, and at this time several stones were removed from the gall-bladder and the cystic duct. Numerous adhesions were found to exist, and no calculus could be felt in the common duct. A biliary fistula continued to secrete for some time, but finally closed. A few weeks later the patient was taken with hepatic colic, relieved by the spontaneous opening of the fistula. August 8, 1892, the abdomen was opened, and the dilated cystic duct anastomosed with the transverse colon, using a small decalcified bone bobbin. After the operation the patient remained in perfectly good health for several months, but again became jaundiced in December, 1892. January 28, 1893, the abdomen was again opened, and the previous anastomoses drawn out from the wound showed the cystic duct greatly contracted, and that there no longer existed any communication between it and the colon, the whole mass between the two viscera being shrivelled to a mere band. It was necessary to tear away a great deal of adherent tissue before reaching the common duct, which was then incised without great difficulty. From this canal a large stone was extracted, and its incised wall was then closed, the sutures being passed with the rectangular-pointed needle destined for staphylorrhaphy. For greater security a drainage-tube was introduced into the right kidney. The patient survived the operation about fifteen days, in spite of the formation of a stercoral fistula. At the end of the first week fecal matter ran out of the drainage-tube.

The post-mortem revealed a small perforation of the colon at the site of the previous cystico-colostomy. The empty condition of the colon at the time of the operation had allowed this perforation to pass unnoticed. Its suture would have been very easy. The death was certainly due to this accident.

B.—CHOLEDOCHOLITHOTRIPSY. (1 Case.)

No. 68. Surgeon: THIRIAR. **Sex and Age:** Female, twenty-nine years. **Clinical History:** Frequent attacks of hepatic colic for two years and a half; increasing in frequency; accompanied by jaundice and fever. **First Intervention:** March 23, 1893. Choledocholithotripsy; vertical lateral incision with a transverse adhesion; gall-bladder atrophied; contains no stone; calculus in common duct; crushing causes the disappearance of the stone. **Result:** After disappearance of jaundice and colored stools, jaundice reappears and also the accidents of retention. **Operation Notes:** March 2, 1894. Choledochotomy; curved incision; numerous adhesions; stone in the supraduodenal portion of the common duct; incision; extraction; no sutures; two drains surrounded with iodoform gauze. **Result:** Recovery; one drain removed the eighth day; stools colored on the twelfth day; all drainage removed at the end of a month; complete cicatrization on the thirty-fifth day.

C.—1. CHOLECYSTOSTOMY AND CHOLEDOCHOLITHOTRIPSY. (1 Case.)

No. 69. Surgeon: COURVOISIER. Sex and Age: Female, thirty-one years. **First Intervention:** March 5, 1889. Cholecystostomy and choledocholithotripsy; biliary fistula persists; stools partially discolored; loss of flesh. **Result:** Complete biliary fistula. **Operation Notes:** March 23, 1890. Choledochotomy and cholecysenterostomy; stone the size of a nut in the common duct; incision, extraction, and suture; cholecysenterostomy with operative closing of the biliary fistula. **Result:** Recovery; for several days a little bile flowed from the wound, coming from the common duct.

In Cases LXVIII. and LXIX. choledocholithotripsy comes into prominence. For the first case it is difficult to know whether the calculus, which, being very movable, disappeared and remained unfound during the efforts to crush it, did not merely escape beneath the liver, or moved towards the duodenum, an accident already noted during choledochotomy (Terrier). The second case (Courvoisier) leaves no doubt as to the reality of the crushing of the stone, and thus far would serve for the estimation of the value of choledocholithotripsy.

C.—2. CHOLECYSTECTOMY AND INCOMPLETE CHOLEDOCHOTOMY. (1 Case.)

No. 70. Surgeon: KEHR. Sex and Age: Female, fifty years. **First Intervention:** October 12, 1892. See Case No. 31. After a period of intermittent functions the fistula closed spontaneously at the end of three months, and at once jaundice and symptoms of obstruction appeared. **Result:** Reappearance of anterior accidents. **Operation Notes:** February 4, 1893. Second choledochotomy; median incision; numerous adhesions; common duct shows no trace of the former incision; large stone in the common duct; incision and extraction; suture with eight silk stitches; drain and iodoform packing. **Result:** Recovery; no flow of bile from the wound; drain removed the third day; colored stool the fifth day; complete cure at end of a month. Visited in June, 1894. Complete cure; a gain in weight of thirty-three pounds in five months.

Kehr, Case LXX., reports the only case that we have found of the reappearance of jaundice with accidents of stenosis after choledochotomy. This recurrence is the more noteworthy from the fact that in this case the first choledochotomy was supplemented with a cholecystectomy. The reappearance of the biliary retention, immediately after the closing of the fistula consecutive to the first choledochotomy, and the three months' time which had passed with a free exit of bile, would make it appear probable, as the surgeon suggests, that this second calculus was not of new formation, but had been overlooked at the time of the first operation.

GROUP IV.—CHOLEDOCHOTOMY BY TWO INTERVENTIONS. (2 Cases.)

No. 71. Surgeon: LANE. Sex and Age: Female, thirty years. **Clinical History:** Hepatic colic for fifteen months, becoming more and more frequent; accompanied by fever and jaundice which has persisted for some months. **Actual Condition:** Chronic jaundice; liver increased in size; gall-bladder not perceptible; temperature, 105° F. **Operation Notes:** December 21, 1893. Vertical lateral incision; gall-bladder not distended but elongated; from it three calculi are removed; a stone in the cystic duct cannot be removed; several large calculi in the common duct, of which two or three

of the largest are behind and beneath the duodenum; incision of the peritoneum on the superior edge of the duodenum (first portion) which permits the liberation and retraction downward of this part; incision of the common duct thus exposed; attempt to extract the calculi is unsuccessful; from the incision matter escapes which is fecal in appearance; incision is sutured; glass drain and iodoform packing, which is changed on the 24th, and found stained with bile, which continues to flow from the drain; jaundice diminishing. January 3, 1894. **Second Intervention:** Common duct opened wider; crushing and removal of several large calculi; the dilated duct admits the finger. **Result:** Recovery; stools slightly colored the tenth day; jaundice disappears; for several days the *débris* of the crushed calculi are eliminated in the bile; the nineteenth day, normal stools and minimum flow of the bile, which soon ceases altogether.

No. 72. Surgeon: QUÉNU. Sex and Age: Female, forty years. **Clinical History:** First attack of hepatic colic six years ago, with intense jaundice for several days, diminishing somewhat with the intensity of the attack; nine months ago, violent attack; jaundice increased; no fever; October 29, pain in the epigastrium; jaundice increased temporarily; stools less colored. **Actual Condition:** Slight jaundice (very little biliary pigment in the urine); stools colored; liver greatly increased in size. **Operation Notes:** November 19, 1894. Median incision; liver passes the costal arch by six finger-breadths; gall-bladder small and empty and situated very low down; stone in the common duct felt by the finger; packing with salol gauze; vomiting of biliary matter the evening of the operation and the next morning; the fifth day, temperature 99° F.; stools discolored; sixth day, November 24, chill, temperature 104.6° F.; jaundice intense; agitation; signs of biliary intoxication; no pain and no distention of the abdomen. **Second Intervention:** November 24, 1894. Packing removed and its cavity washed out with a solution of boracic acid; the calculus found and maintained with the finger; its extraction is accomplished by incision and the aid of a curette; drainage. **Result:** Recovery; temperature normal in the evening; jaundice disappears rapidly; stools colored; from November 29 to December 9 the bile flows abundantly from the wound, but had stopped entirely December 28; at the end of January, 1895, complete cicatrization.

GROUP IV.

Choledochotomy by two Interventions,—Two Cases,—Nos. 71 and 72.

The two cases of this group are alike in that the extraction of the calculi was only accomplished several days after a primary intervention, terminated by the packing of the region and a sufficient delay to allow the formation of adhesions, and thus a limitation of the field for the secondary intervention. But in other respects the cases differ essentially from each other. Lane, in his first intervention, incised the common duct, and vainly attempted to extract the stones lying in the portion situated behind the duodenum; but the liquid, flowing from the duct at each effort to remove the calculi, seeming to be intestinal and threatening to infect the peritoneal cavity, influenced the surgeon to suture the incision and pack and drain the region, postponing any further intervention until the formation of sufficient adhesions should guarantee the abdominal cavity from infection. In spite of the suture of the common duct, as frequently happens even after the extraction of the calculus, the gall soon flowed from the drain, and a biliary fistula was established. The jaundice diminished considerably, and thirteen days later the adhesions were judged sufficient to allow the second intervention. The opening into the common duct was enlarged, and the calculi removed. In fact, this case represents rather two choledochotomies,

separated by a short interval of time, than a choledochotomy by two interventions.

In Quénu's case the *modus operandi* is very different. The first intervention is limited to a laparotomy and exposure of the common duct in which the stone is recognized. The region is then packed, and all left thus for five days, when the severity of the accidents caused by the biliary intoxication necessitates the next intervention without further delay. This second action consists in the incision of the common duct and the extraction of the calculus, the walls of the canal not sutured.

Such procedure has in its favor the general advantages of any operation in successive stages and the security offered by the adhesions, if not before existing. But it has the inconvenience of delaying the surgical aid, which frequently ought to be given promptly, and the case of Quénu itself shows the danger of long delay.

GENERAL CONSIDERATIONS.

CONDITION OF THE GALL-BLADDER, SITUATION OF THE CALCULI, AND MORTALITY STATISTICS.

Having finished with our study of the cases in groups, certain general considerations may be permitted.

The condition of the gall-bladder is not only important for the diagnosis before operation, but its modifications from the normal may greatly influence the conduct of the surgeon during the intervention. Fourteen case-histories fail to mention the gall-bladder at all, and four times the report only says that it was clinically imperceptible. In fifty-four cases of which the reports note the gall-bladder, it is mentioned for the primitive choledochotomy, or for the intervention preceding the secondary choledochotomy, as: not to be found, five times; very small, forty times; of ordinary dimensions, four times; of slightly increased volume, three times; dilated (Case XLIII.), once, and greatly dilated (Case LXII.), once; total, fifty-four. These figures confirm the observed frequency of contracted gall-bladder in cases of calculous stenosis of the common duct, and give positive value to this contraction as a symptom of stone in the common duct, the cause of the jaundice. This sign has been strongly insisted upon by Courvoisier and Terrier, who declare that the gall-bladder is rarely clinically perceptible in case of calculous obstruction of the common duct, whereas the impermeability of the canal, due to external pressure brought upon it (neoplasm of the pancreas, etc.), most frequently coincides with a dilated gall-bladder, forming a hard tumor to be felt beneath the edge of the liver. The contraction of the gall-bladder and its usual adhesion to the inferior surface of the liver, in case of lithiasis, marks the result of calculous angiocholitis, cholecystitis, and pericholecystitis. The chronic inflammation of the biliary ducts produces a cicatricial retraction, especially pronounced for the gall-bladder, whose atrophy it thus causes.

Forty-five times in the seventy-two cases calculi were found in the gall-bladder simultaneously with the calculous stenosis of the common duct. Forty-four reports describe the situation of the stones removed from the common duct, as: twenty-four cases in which the calculi were found in that portion of the canal above the duodenum; three times between the liver and the duodenum; five times near the duodenum; once in the middle segment of the common duct; five times behind the first portion of the duodenum; once in the head of the pancreas; and five times at the opening of the common duct into the duodenum. That is to say, thirty-two of forty-four choledochotomies revealed the stone in the part of the common duct situated above the duodenum. The histories of the twenty-eight other cases do not mention the site of the stone, but other indications would make it appear that in these cases also the stones were extracted from the free supraduodenal portion of the common duct. The manipulation described would have been scarcely possible for the extraction of a calculus from the retro- or infraduodenal portion of the canal. The absence of any special procedure, no mention of the pancreas or duodenum, would not be probable in case of extraction of calculi from other than the supraduodenal portion of the common duct. This superior part of the canal is, then, almost exclusively interested in the operation of choledochotomy, both because of the greater frequency of stone in this portion, and because of the greater difficulty of exploration and operation of the calculi in the retroduodenal and pancreatic part, which would allow the stone to pass unnoticed even after laparotomy, or would render a cholecystostomy or cholecystenterostomy preferable.

MORTALITY.

Seventy-two cases of choledochotomy give us fifty recoveries and twenty-two deaths, a mortality of 30.55 per cent. But the operations *in extremis* and others, where the fatal cause was manifestly due to the loss of the hepatic function, ought not to be allowed to charge our statistics. The deduction of these cases would reduce the mortality to about twenty per cent., and this would appear to represent the actual operatory loss. Remember, however, that this figure includes deaths from such accidents as greater familiarity with the operation, and the care which can be taken when forewarned, should enable the present operators to avoid. It would seem that a mortality much less than twenty per cent. should be expected for the future of this operation.

The causes of death may be resumed in groups as follows: Choledochotomy, simple, twenty-six operations, twelve deaths = 46.15 per cent.; six deaths from insufficiency of the hepatic function, three of which were operated upon *in extremis*; three deaths from peritoneal infections (one from perforation of the colon during the dissection of adhesions, one from effusion of bile into the abdomen and insufficient drainage, and one the cause of which is not clear); one death from intra-canalicular hemorrhage, acute cholæmia; two deaths in which the cause is not determined with precision.

Choledochotomy with cholecystectomy, nine operations, three deaths = 33.33 per cent.; three deaths (one from stroke, one from insufficiency of the hepatic function, and one from peritoneal infection, bile in the abdomen). Cholecystotomy, eleven operations, two deaths = 18.18 per cent.; two deaths (one from pulmonary congestion, and one from a probable peritoneal infection). Cholecystostomy, eleven operations, three deaths = 27.27 per cent.; three deaths (one from peritoneal infection, effusion of bile in absence of drainage, one from peritoneal infection, effusion of bile, and one from peritoneal infection probably). Secondary choledochotomy, fourteen operations, two deaths = 14.28 per cent.; two deaths (one from shock, two successive laparotomies in a short space of time, and one from peritoneal infection, perforation of colon).

The number of cases for each group is so limited that it would be hazardous to draw positive deductions. But in looking over this table we are forcibly struck by several items: The great mortality of the incision of the common duct with no supplementary operation to guard against any retention of the bile. The mortality diminishes rapidly as the bile-ducts are drained, and in secondary choledochotomy is so small that the operation becomes benign; the more so when it is seen that the two deaths of this group resulted from causes that a careful surgeon ought to avoid. In this group neither the infection of the peritoneum by the bile nor the insufficiency of the hepatic function plays the deadly rôle so frequently encountered in cases of simple choledochotomy.

OPERATORY TECHNIQUE.

Terminating the review of the cases, a description of choledochotomy will be given. The other operations with which it is frequently combined, not being included in our study, would be better reviewed elsewhere. The preparation of the patient involves the precautions necessary for every laparotomy. The milk diet and intestinal antiseptic preparations will be found to be useful precautions.

The operation will be considered under five heads.

1. Incision of the abdominal wall.
2. Dissection of the adhesions, search for the gall-bladder, and examination of the common duct. Determination of the calculi.
3. Incision of the common duct. Extraction of the stones.
4. Catheterization of the common duct. Suture of its incision.
5. Drainage. Suture of the abdominal incision.

1. Incision of the Abdominal Wall.—Discussion.

It would seem as if every incision of the anterior abdominal wall that could expose the liver ducts had been used for choledochotomy. That most frequently employed—twenty-three times out of the fifty-three cases which describe the incision—is the vertical incision on the left border of the right rectus, but mention is also made of the median incision of an

oblique curved cut parallel to the costal arch, the transverse, various varieties of T-incisions which result from the combination of the median or lateral vertical with the transverse incision of the rectus. The advantages and inconvenience of each have been many times discussed.

The vertical incision on the external border of the right rectus would best expose the gall-bladder in its normal position, but the common duct generally lies much nearer the middle line. With the external border of the rectus at sixty, seventy, and eighty-five millimetres from the median line, we have found, by examination of ten subjects, the common duct at only twenty, twenty-five, twenty-five, thirty, thirty-two, thirty-five, thirty-five, forty, forty-three, and sixty millimetres, respectively, from the median line. Quénu reports the following distances for the origin of the common duct: twenty, thirty, and thirty-five millimetres; for its termination, eighteen, twenty, and thirty millimetres.

The oblique transverse incision, parallel to the edge of the liver, exposes both the gall-bladder and the common duct; but it has the great disadvantage of sectioning more or less transversely all of the abdominal muscles, thus exposing the patient, in the greatest degree, to a subsequent abdominal hernia.

Wright, Mears, and Reboul have reported operations on the gall-bladder by means of a lumbar incision, but in all these cases this approach was selected because of an error of diagnosis. No mention of such incision is found in the cases of our study. Its inconvenience is manifest when it is recalled that by this means an access to the retroduodenal and pancreatic portion of the common duct alone can be obtained. The necessity of examining the gall-bladder and bile-ducts would be sufficient to cause the rejection of the lumbar route so well studied by Tuffier.

The T-incisions, frequently employed in Germany and the United States, certainly give a more easy access to the inferior surface of the liver, and are especially convenient in case of hypertrophy of that organ, on account of the depth at which the intervention on the common duct must necessarily be accomplished. But here, also, is the danger of subsequent hernia, and for operation by this method most extensive packing and drainage are necessary.

In case of need, the transverse section of the rectus may be added to the vertical incision, and the T-opening thus formed be utilized. But at the beginning of the operation it is best to employ only a long, vertical incision, median or lateral.

The median incision, from the xiphoid appendix to the umbilicus, best corresponds to the anatomical disposition of the common duct, and, besides, its superior limit, higher than that of the lateral, would allow deeper access to the inferior surface of the liver, if hypertrophied. An intervention limited to the common duct would, therefore, make a median incision preferable, but the operation under ordinary conditions is attempted for a chronic jaundice attributed to lithiasis, but with no indication as to

whether the intervention will be upon the gall-bladder, or only upon the common duct, or upon both at the same time. Forty-five out of the seventy-two cases, two-thirds, report a lithiasis of the gall-bladder and cystic duct simultaneous with that of the common duct; the former should, therefore, be considered in determining the incision, for the first operation must always deal with this organ, and frequently with it alone, and, besides, the gall-bladder serves as a most excellent guide to the common duct.

The vertical incision on the external border of the right rectus, descending from the costal arch for a distance of twelve to fifteen centimetres, will, therefore, be chosen. This permits a sufficient examination of the inferior surface of the liver, and, if too cramped for the intervention on the common duct, the transverse section of the rectus will give abundant working room.

2. Dissection of the Adhesions, etc.

The incision of the abdominal wall exposes the edges of the liver, beneath which the gall-bladder is to be searched for. From there, penetrating farther under the liver and beneath the organs below it, the omentum, colon, and duodenum, under normal conditions it is easy to reach the common duct, the finger following the right edge of the gall-bladder, and then penetrating the foramen of Winslow. But in cases of lithiasis the conditions are rarely the same. Here the subjacent organs adhere firmly to the inferior surface of the liver, and in the midst of this mass of adhesion the atrophied gall-bladder is frequently so hidden as to be found only with the greatest difficulty. The depth at which the intervention on the common duct must be made is often increased by the hypertrophy of the liver. A slight cholecystitis or pericholecystitis allows a sufficiently easy access to the common duct; but the majority of the reports mention this dissection of the adhesions as very tedious and difficult, the mass so mingled that the knowledge of the normal anatomy of the region serves but little for exposing the common duct. The contracted gall-bladder adheres most frequently to the colon and the duodenum, sometimes to the stomach; but the constant adhesion is found between the liver and the omentum and transverse colon, which must first be separated. The notch in the edge of the liver indicates the probable site of the gall-bladder, which, if found free from adhesion, guides easily to the cystic and common ducts. The liberation, by dissection if necessary, is often difficult, and should be accomplished as far as possible with the aid of the finger; knife and scissors, however, may frequently have to be used. Great care must be taken not to perforate colon, duodenum, or stomach; nor to cut unknowingly any fistula existing between the bile-passages and other viscera. It will also be remembered that the vermiform appendix may occupy this region abnormally. Its section must be avoided. Abscesses may be encountered in the midst of these adhesions, and their careful disinfection and packing cannot be neglected.

The various viscera dissected and separated from each other, and from the inferior surface of the liver, the first effort is made to find and examine the common duct, which is not always easy, on account of the fleshy condition usually encountered in patients of this class, and the increased volume of the liver. The edge of this organ, protected by a sterilized towel, is lifted with a spreader in the hands of an assistant at the left of the operator, while a second assistant, opposite, having covered the stomach and intestines with sterilized towels with the right hand, pulls the stomach to the left, at the same time depressing the intestines with the other hand. The use of the inclined plane for this operation diminishes the obliquity of access to the under surface of the liver, and allows the surgeon to see much better. The assistants spread the wound as widely as possible deep down into the abdomen. The left forefinger, then, guided by the gall-bladder and the cystic canal, descends to and enters the foramen of Winslow, hooking the right border of the gastro-hepatic omentum, the common duct, the vena porta, the hepatic artery and ganglia, all of which the finger draws down and forward. The thumb of the same hand, or perhaps more conveniently the right forefinger, then feels over the anterior surface of the pedicle of the liver, examining carefully, by pressure between the two digits, all of the mass from the liver to the duodenum, the hepatic duct, the mouth of the cystic, and the supraduodenal part of the common duct. This methodical palpation could scarcely let a stone in this portion of the ducts pass unperceived. To complete the examination of the common duct, a search must now be made for stone in the retroduodenal and pancreatic portions, which is also done by digital palpation. The left forefinger is withdrawn from the foramen of Winslow, passed to the right of, and, as far as its mobility allows, behind the duodenum, which it compresses as much as possible to approach the common duct. The left thumb, or the other forefinger, then compresses the parts against the posterior digit, and in this way explores for stone behind the duodenum and pancreas. A calculus felt by this palpation must then be distinguished from ganglia, which might be met with in this region.

3. Incision of the Common Duct.—Extraction of the Calculi.

The examination has demonstrated the existence of a stone in the common duct, which can only be extracted by incision of the canal, an incision which may vary with the portion of the duct to be attacked. For surgical consideration the common duct may be divided into two parts, the one supraduodenal, A, attainable above the duodenum, the other, B, situated behind the duodenum and pancreas. We have seen that the greater number of the calculi of the common duct occupy the portion A. This part, exposed by drawing down the duodenum one or two centimetres, corresponds to the right border of the gastro-hepatic omentum, a trifle below and in front of the foramen of Winslow. The vena porta lies to the left and behind the common duct, while to the left and in front of the vena porta lies the

hepatic artery, from which the right gastro-omental passes downward, behind the first part of the duodenum, towards the inferior border of the stomach. This supraduodenal portion of the duct is frequently crossed anteriorly by branches of the duodenal or gastro-omental veins, to the injury of which may probably be attributed the strong hemorrhages reported in some cases.

The common duct, in its normal condition a small canal of five to six millimetres calibre, closely following the vena porta, differs widely from the duct; in cases of calculous stenosis, in which the biliary retention has almost invariably produced a large dilatation of the duct, its walls are usually thickened. The situation of the stone well determined, and the other viscera drawn aside, and protected by aseptic towels from any possible contamination from the gall, the incision of the common duct is made longitudinally, but directly upon the calculus, which is the only guide for the cut. For this manœuvre the left hand plays an important part, being introduced by the foramen of Winslow, passed behind the common duct, which it holds fixedly, and at the same time pressing forward the contained stone, assuring its immobility. Sometimes, however, the mass of adhesions allows the insertion of only the left forefinger to fix the stone, while the knife cuts the wall of the duct. The incision is often followed by a more or less severe hemorrhage of venous origin, rapidly stopped by compression. The edges of the incision may be maintained open by pressure forceps, or by loops of thread such as Lauenstein places in the walls of the duct before its incision, which serve him later for a complementary suture.

The extraction of the stone through the cut must sometimes be aided by a director or curette, in order to detach the adhesions of the calculus to the wall of the duct. Sometimes even crushing must be resorted to, and the extraction be accomplished by the removal of the pieces. By the same incision other calculi, included and movable in the duct, can also be extracted.

B.—Calculi of Retroduodenal and Pancreatic Portion of Common Duct.
—When a stone lodged in this portion of the duct is sufficiently movable to be pushed upward into the portion A, its extraction is accomplished in the manner just described. But when fixed in its lodge, the direct incision upon the calculus must be resorted to, and here the position of the duodenum and pancreas in front of the duct requires special attention. This portion, B, of the common duct is much longer than the portion A, which has a length of only two to two and a half centimetres, while B averages seven centimetres in length. It will be remembered, however, that the calculi rarely occupy this long portion, and their different situation, high or low, renders their removal possible in various ways: First, by the dissection of the superior edge of the first portion of the duodenum, which can then be drawn down to expose the duct containing the calculi behind, Cases XLI., LXII., and LXXI.; second, by an incision traversing the pancreas to

reach the stone felt in the head of this gland, Case X.; third, by drawing the duodenum upward, the incision of the common duct could be made next to the postero-inferior surface of the bowel, and thus permit the extraction of a stone situated just above the ampulla of Vater, Case LXVI.; fourth, by opening the duodenum itself, a duodeno-choledochotomy could be made (McBurney). The retroduodenal and pancreatic portion of the common duct has, thus far, been rarely reached by choledochotomy, but it is probable that the extraction of the stones there situated will be more frequently accomplished as the method and necessity of examining this deep portion of the duct become better known and are more frequently practised.

4. Catheterization of the Common Duct and Suture of its Incision.

Having removed the stones from the common duct, its permeability must be assured by passing a catheter up towards the liver and then downward to penetrate into the duodenum. A flexible olive catheter No. 9 or 10 is to be preferred for this manoeuvre. The dilation of the common duct is sometimes so great that for this exploration the finger can be substituted for the catheter, but even in such cases the catheter must be used to make sure of the permeability of the ampulla. Certain to have left no stone, the edges of the incision are to be sutured, and this can be done in various ways; in a single plane with from three to eight suture points, Lembert stitches, or a running, overhand thread, or the suture may be in two rows, first uniting the walls of the duct, and over this suturing the surrounding tissues. Three rows of sutures have sometimes been employed. Silk would seem to be preferable as suture material. In ten cases the incision of the common duct was left unsewn; three times the patient was operated upon *in extremis*, Cases VIII., XXIII., and XXXIX.; twice suture was impossible on account of the bad condition of the duct walls, Case LXVIII., or the great depth of the wound, Case LVI.; three times the pre-existing adhesions made the suture unnecessary, Cases XLVIII., LXXI., and LXXII., the packing and drainage of the wound being amply sufficient to assure the result. Once a glass tube was introduced and left in the common duct to bring the gall to the exterior. In all of these cases, except those operated upon *in extremis*, the recovery took place without incident other than the formation of a biliary fistula, which closed spontaneously a few weeks later.

5. Drainage.—Sutures of the Abdominal Wound.—Dressing.

The extreme difficulty, and consequent incompleteness, of the suture of the common duct, the doubt which remains in regard to the permeability of the canal in spite of careful catheterization, the possibility of temporary or permanent obliteration by coagulated blood, all these indicate the necessity for drainage, which we therefore recommend, in spite of the strong personal predilection of one of us to avoid it, and notwithstanding a conviction that

the drainage itself is frequently the cause of the biliary fistula so often resulting from this operation. The drainage should be accompanied by a packing of sterilized gauze, the extremities of which are left protruding from the abdomen. The parietal wound is then closed with three rows of stitches, sewing the peritoneum with a lock-stitch of fine silk, the muscular sheath with a running silk thread, and lastly the skin with single points of silk-worm gut. The dressing consists of a sterilized towel, or gauze band covered with sterilized cotton, and the whole is maintained with a flannel bandage.

POST-OPERATORY RESULTS.

A choledochotomy without complications, generally gives a rapid uneventful recovery. A few days after the operation a slight flow of bile from the drain may be observed, which either ceases almost immediately or results in a biliary fistula, closing some weeks later. The stools of the patient are found normally colored by the biliary secretions, almost immediately after the operation. The jaundice disappears rapidly, but the liver may long remain of increased volume. If the operation is followed by a cholecystostomy, it is remarkable to see how soon the flow of the bile from the open gall-bladder ceases, with the re-established permeability of the common duct.

The calculous tendency requires dietary precautions that should be indicated for the patient's future guidance.

PERMANENT RESULTS OF SUCCESSFUL OPERATIONS.

As is usual for this heading, the lack of details to be obtained for its study is deplorable. Of the seventy-two clinical histories, only twenty-seven follow the patient beyond the recovery from the operation. Küster, Case IV., mentions the reappearance of hepatic colic five months after the choledochotomy, colic which a cure at Carlsbad, the next year, relieved by the evacuation of two calculi. It will be noted, in this case, that the non-dilated gall-bladder was not opened during the operation, and it may be possible that here were hidden the small concretions which may have formed the nuclei of the stones subsequently eliminated. Twenty-six patients were re-examined after the choledochotomy, seven within the first six months, six between six months and one year, four at the end of one year, one after fifteen months, one sixteen months, two eighteen months, two twenty months, two twenty-one months, one three years, and one four years after the choledochotomy, and in all the recovery is noted as complete and permanent.

BIBLIOGRAPHY.

- Abbe: New York Medical Journal, 1892, vol. i. p. 121.
Anderson: Lancet, 1894, vol. ii. p. 1152.
Billroth: International klinische Rundschau, 1893, p. 332.
Braun: Verhandlungen der deutschen Gesellschaft für Chirurgie, 20th Session, 1891, vol. i. p. 143.

Courvoisier: *Casuist. Statistik. Beiträge zur Pathologie und Chirurgie der Gallenwege*, Leipzig, 1890, p. 281.

Czerny,—see Mermann: *Beiträge zur klinische Chirurgie*, 1895, p. 361.

Doyen: *Archives provinciales de Chirurgie*, 1892, p. 169.

Duncan: *Edinburgh Medical Journal*, 1893, vol. xxxviii., pt. 2, p. 1081.

Elliott: *Boston Medical and Surgical Journal*, 1894, p. 83.

Frank: *Wiener klinische Wochenschrift*, 1891, p. 960.

Heussner,—see Voigt: *Deutsche medicinische Wochenschrift*, 1890, p. 766,

Case VII.

Hochenegg: *Wiener klinische Wochenschrift*, 1891, p. 960.

Kehr: *Deutsche Zeitschrift für Chirurgie*, 1894, vol. xxxviii. pp. 354, 361, 367, 387, and 391; *Berliner klinische Wochenschrift*, 1893, pp. 41, 69, 169. See Martig.

Körte: *Verhandlungen der deutschen Gesellschaft für Chirurgie*, 22d Session, 1893, p. 70.

Kümmel: *Deutsche medicinische Wochenschrift*, 1890, p. 237, and personal communication.

Küster: *Verhandlungen der deutschen Gesellschaft für Chirurgie*, 20th Session, 1891, p. 400.

Lagenbuch: *Berliner klinische Wochenschrift*, 1884, p. 828.

Lane: *Transactions of the Clinical Society, London*, 1894, p. 149, Case XXVII.; *Lancet*, 1895, vol. i. p. 547.

Lauenstein: *Esmarchs Fetschrift*, 1893, p. 342, Case XI., and personal letter.

Lepetit: Thesis, Paris, 1894, "De la Cholelithotomie."

Lloyd,—see Terrier: *Revue de Chirurgie*, 1892, p. 922.

Mallam and Howse: *West London Medical Society*, reported in *Lancet*, 1892, May 28, and personal letter.

Martig: Thesis, "Zur Chirurgie der Gallenwege," Basel, 1893.

Michaux: *Bulletin de la Société de Chirurgie*, Paris, May, 1895.

Murphy: *New York Medical Record*, 1894, vol. i. p. 69.

Parkes: *American Journal of the Medical Sciences*, 1885, vol. xc. p. 95.

Pozzi: *Bulletin de la Société de Chirurgie*, Paris, 1894, vol. xx. p. 630.

Quénu: *Bulletin de la Société de Chirurgie*, Paris, April, 1895, and *Progrès médicale*, 1895, p. 306. See also Lepetit.

Rehn: *Verhandlungen der deutschen Gesellschaft für Chirurgie*, 20th Session, 1891, p. 143.

Riedel: *Erfahrungen über die Gallensteinkrankheit*, etc., Berlin, 1892, p. 103.

Roux: see Martig and personal communication.

Schwartz: *Bulletin de la Société de Chirurgie*, 1895, and personal communication.

Socin: *Krankheit Geschichte Spital-Basel*, 1892. See Martig.

Studsgaard,—see Terrier: *Bulletin de la Société de Chirurgie*, December, 1892.

Sutton,—see Terrier: *Revue de Chirurgie*, 1892.

Terrier: *Revue de Chirurgie*, 1892, p. 922; *Bulletin de l'Académie de Médecine de Paris*, March, 1894.

T. Hiriar: *Gazette hebdomadaire de Médecine et de Chirurgie*, 1894, p. 386.

Thornton: *Lancet*, 1891, p. 463.

Van der Veer: *New York Medical Record*, 1891, vol. ii. p. 646.

TRAUMATISM AND HÆMATOMYELIA AS CAUSES OF SYRINGOMYELIA.

FROM THE WISTAR INSTITUTE.

BY WM. G. SPILLER, M.D.,

Associate in Clinical Medicine, Pepper Laboratory.

OWING to the kindness of Dr. De Forrest Willard, we have been able to examine microscopically his case of fracture at the fourth cervical vertebra, and from the report which Dr. Willard has permitted us to make with him we reprint an abstract of the histological examination. For clinical and surgical details we refer the reader to the *Annals of Surgery*,¹ merely mentioning that the body of the fifth cervical vertebra pressed upon the cord. Death occurred thirty-six hours after the accident. The fifth cervical segment showed considerable alteration of tissue; above the lower part of the fourth and below the upper part of the sixth segment very little that was pathological could be noted.

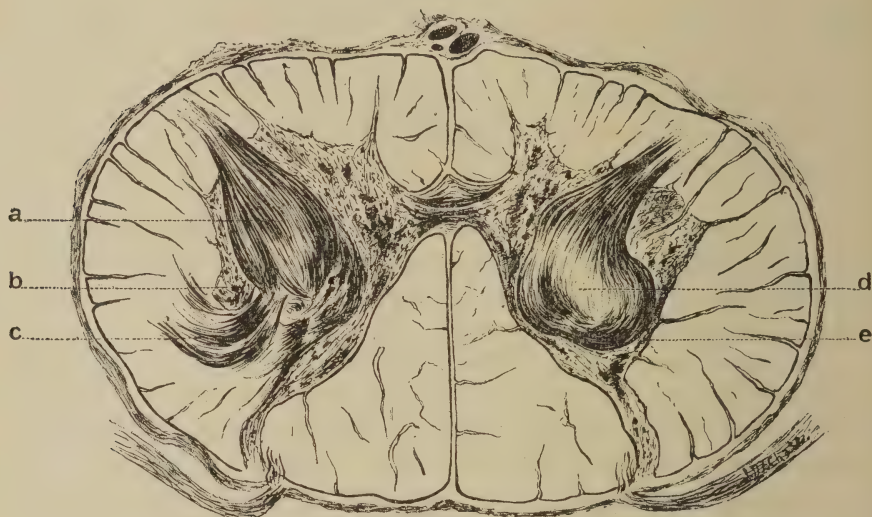
In the fifth cervical segment the fibres of the median portion of each lateral column were pressed from a longitudinal into a horizontal course; in the upper portion of the segment each anterior horn was encroached upon at its posterior border by these fibres; slightly lower the interior of the right anterior horn was filled by a mass of fibres from the anterolateral column, and was surrounded at all points by a hemorrhagic ring of gray matter; still lower in the segment the anterior border of each anterior horn was broken through by penetrating fibres. The force seemed to have been exerted at the centre of the cord and from the front, probably from pressure by the fifth cervical vertebra, and it appeared as though a wedge of fibres had been driven into each anterior horn from the white matter. (See illustration.) The hemorrhage in the white matter was not great at any point; throughout the destroyed area there was extensive hemorrhage in both anterior and posterior horns, leaving the commissures free, and this was greatest at the upper part of the sixth segment, where the fibres of the white matter appeared normal. This partiality of the hemorrhage for the gray matter is very striking. Many swollen axis-cylinders were noticed, especially in the direct cerebellar tracts at the lower portion of the lesion; a few could also be seen in the anterior part of the posterior columns; otherwise these columns were in a normal condition. Little or no round-cell infiltration had occurred.

¹ Case to be published in a future number of this journal.

It would have been impossible to imagine, from the external appearance of the cord, that such serious changes had taken place at the centre.

By the method of Marchi the myelin was shown to be greatly altered at the seat of lesion, and yet neither ascending nor descending degeneration

FIG. 1.



Section at the junction of the fifth and sixth cervical segment. Profuse hemorrhage in the gray matter.—*a*, fibres from the antero-lateral column within the gray matter of the left anterior horn; *b*, displaced portion of left anterior horn; *c*, displaced fibres of the lateral column; *d*, displaced fibres from the antero-lateral column in the right anterior horn; *e*, narrow zone of gray matter, which at a level slightly higher in the cord is broken through by fibres from the lateral column in the manner shown at *c*.

was present. The explanation is, probably, that the myelin sheath is dependent upon the axis-cylinder. (Lenhossék.¹) Where this was injured the sheath suffered also, but as the axis-cylinder had not been destroyed in its entire length, at parts more remote it could probably still exert a nourishing influence upon the myeline sheath. Secondary degeneration occurs probably later than that at the traumatic zone, as this case indicates.

The subject of hemorrhage in the spinal cord is of interest. Gowers² believes that concussion can give rise to myelitis, but acknowledges that in many of these cases there have been minute foci of structural change. Thorburn,³ however, regards the theory of concussion as "vague and unsatisfactory," and declares that many such cases are in reality hæmatomyelia. It is not possible to deny that cells and nerve-fibres may be affected by external force in such a way that function is greatly altered, without organic changes being present which can be seen by the methods of staining and with the microscope. Thorburn is probably correct when he states that

¹ Der feinere Bau des Nervensystems, p. 59.

² Gowers, Diseases of the Nervous System, 1892, vol. i. p. 301.

³ Thorburn, A Contribution to the Surgery of the Spinal Cord, p. 63.

the number of cases of hæmatomyelia in actual practice is probably much underestimated, and that many such cases are regarded as instances of concussion of the spine without organic lesion. He attributes this failure of correct diagnosis after injuries of the spine to the relative infrequency of post-mortem examination. These cases are not nearly so fatal as fractures and dislocations, and their true pathology is therefore not generally recognized. In fifteen cases of fracture or dislocation which he describes all but one were fatal, whereas of his six cases of hæmatomyelia only two died, and in one of these this event occurred some years after the hemorrhage.

Gowers¹ gives an interesting explanation of myelitis due to functional overaction. Active function, according to his view, causes vascular dilatation, which when excessive becomes congestion, and, if prolonged, is attended by the escape of leucocytes, that renders the condition one of inflammation. A congestion so intense as this must frequently be associated with rupture of these delicate vessels, so poorly supported by the comparatively loose gray matter. Indeed, Ziegler² says capillary hemorrhages are not rare in congestive hyperæmia of the brain, and Gowers also, in another place (*loc. cit.*, p. 299), explains the small extravasations found in some cases of hydrophobia, of tetanus, and of strychnine-poisoning by the excessive functional action of the cord.

We must attribute the hemorrhage in this case chiefly to congestion, for the vessels of the pia, of the gray matter, and some of those of the white matter are filled with blood. Some of the vessels may have been directly torn by the displaced fibres of the white matter, but even where these fibres have been most altered in their course numerous hemorrhages are found in portions of the gray matter apparently otherwise normal, and in the mass of displaced fibres and the adjoining white matter hemorrhage is far less extensive than in the gray matter. And lower in the cord, where the fibres have a normal course, the hemorrhage is closely confined to the gray matter, and is considerably greater in degree than at the location of greatest destruction. We will not deny that gravity may have had some influence in regard to this latter point, but such an explanation will not answer for the comparative freedom from hemorrhage in the white matter. The vessels here were exposed to the same danger of rupture by the action of the displaced fibres as those in the gray substance.

It is possible that many cases of nervous troubles after railway accidents are the result of multiple small hemorrhages in the cord.

The myelitis produced by toxic blood conditions is attended by hemorrhage, and in cases of severe malaria and other infectious diseases small hemorrhages are found in the brain substance. (Ziegler.³) This is probably due to the altered condition of the vascular walls from the effects of

¹ Gowers, *loc. cit.*, p. 302.

² Ziegler, *Lehrbuch der speciellen pathologischen Anatomie*, vol. ii., 1895, p. 349.

³ Ziegler, *loc. cit.*, p. 349.

the toxine. Sottas¹ also attributes paralysis in infectious diseases to vascular changes, and quotes Lancereaux. Raymond² has described a case of hæmatomyelia due to tubercular meningomyelitis, in which the hemorrhage was limited to the gray matter.

Likewise Charrin,³ in France, in his numerous experiments with the bacillus pyocyaneus has been able to produce spastic paraplegia in the animal due to central hæmatomyelia.

In cases of spinal syphilis small hemorrhages are not uncommon.

These examples show that spinal hemorrhage, more especially the capillary variety, is by no means an unknown condition. The explanation for the limitation of the hemorrhage to the gray matter is not far to seek. This tissue is looser in structure, more yielding, offers less support to the small vessels, as the nerve-fibres here form a reticulum, and no longer present parallel vertical columns, as in the white matter. The gray matter is richer in vessels than the white,—perhaps because the nerve-cells need more nourishment than cellular processes, and the arteries here are larger than most of those of the white matter. The arteries of the anterior fissure, which supply the greater part of the gray substance, are among the largest in the cord.

Thorburn⁴ gives two explanations for hæmatomyelia due to violence. He discards the concussion theory for the production of hemorrhage,—i.e., that the cord is “jerked violently backward or forward against its containing canal, and thus bruised.” He prefers the theory that there has been in all cases a diastasis or partial dislocation, with recoil, or that an acute bend has produced such a lesion. Cases of hemorrhage in the cord occur from trauma in which the vertebral column is uninjured (Thorburn); the manner of this is not known, but primary central hæmatomyelia can not be considered common. (Oppenheim.⁵)

We have been speaking more of the capillary hemorrhages. It is the more profuse outflow of blood, and the connection of this with syringomyelia, and the subject of cavity-formation in general, which concern us chiefly at present.

The existence of cavities due to myelitis is one of the most disputed points in nervous pathology. Hallopeau, and later Joffroy and Achard⁶ (1887), described myélite cavitaire or lacunaire, and this view has been supported by Marinesco, Charcot,⁷ Brissaud,⁸ etc.

¹ Sottas, translation, INTERNATIONAL MEDICAL MAGAZINE, October, 1895, p. 667, and Paralyties Spinales Syphilitiques, p. 103.

² Raymond, Revue Neurologique, 1893, p. 98.

³ Charrin, Semaine Médicale, 1895, p. 377.

⁴ Thorburn, loc. cit., p. 64.

⁵ Oppenheim, Nervenkrankheiten, p. 233.

⁶ Joffroy and Achard, Arch. de Phys., 1887.

⁷ Charcot, Leçons du Mardi, 1889, p. 490.

⁸ Brissaud, Maladies nerveuses, p. 201.

Ziegler¹ states that in certain cases which can be considered as atypical, in comparison with the typical, these cavities, surrounded by neuroglial tissue, are formed by a slight proliferation of the neuroglia about the foci of disintegration, and he calls attention to the fact that the amount of neuroglial tissue in these cases is not great.

This idea has been strongly opposed. Gowers² speaks of cysts in the cord due to old hemorrhages, the formation of which is similar to those following cerebral hemorrhages. He calls these focal hemorrhages. He likewise speaks of hemorrhage into a glioma already existing and into cavities in the cord, which may sometimes be of considerable vertical extent; in one case a fissure in the posterior cord was filled with blood almost throughout the whole length of the cord. Such a condition favors the occurrence and extension of hemorrhage. But Gowers³ believes that syringomyelia is a congenital condition. We will give his own words: "That the morbid state (syringomyelia) takes its origin in abnormal conditions during the development of the cord is practically certain from their seat and features. . . . It is probable, therefore, that this conclusion is also true of cavities of similar character and position in which no gliomatous tissue can be recognized, and most of the hypotheses regarding the origin of such cavities from processes of simple myelitis and the like have no sufficient foundation." "Sarcomata may also grow from the tissue around the central canal. . . . Hence it is not surprising that the condition of syringomyelia, even if this is congenital in origin, should be frequently associated with definite tumors."⁴ Brissaud⁵ thinks that syringomyelia may be a variety of myelitis either with or without cavity-formation, and that the production of gliomatous tissue is subordinate to a whole series of common causes, especially to those of an irritative nature. It may develop after any process of myelitis, and a primary medullary hemorrhage causes it *in situ*. He states that it has been formed experimentally by traumatism in the laboratories of physiology, and, according to all probability, it is the syringomyelia which is secondary, and not the hæmatomyelia.

Strümpell⁶ does not think it improbable that certain cases of syringomyelia may be attributed to a primary hemorrhage in the cord.

Kronthal⁷ has seen cavity-formation in the cord following venous stasis, caused by a diminution of the calibre of the spinal canal. According to his view, if a tumor compresses the cord, the returning circulation is disturbed, and a passive congestion results, from which syringomyelia sooner or later develops.

Vertebral caries, even without exostosis, can cause a circumscribed

¹ Ziegler, loc. cit., p. 289.

² Gowers, loc. cit., p. 392.

⁴ Gowers, loc. cit., p. 568.

³ Gowers, loc. cit., p. 572.

⁵ Brissaud, loc. cit., p. 168.

⁶ Strümpell, *Specielle Path. u. Ther.*, vol. iii. pp. 327 and 186.

⁷ Kronthal, *Neurol. Centralblatt*, 1889, Nos. 20 and 22.

pachymeningitis which produces the same condition. (Verhoogen and Vandervelde.¹)

Numerous cases have shown that hemorrhage of the cord is most frequently limited to the gray matter, for the reasons given, and it may be in the form of a long-extended column, and in some cases may be followed throughout the entire cord. (Levier, Leyden, Oppenheim,² Minor.³) In the present case it was short in extent and involved the fifth and part of the sixth cervical segment. This strict limitation to the gray matter and the long extent of cord it may occupy are important points in its favor as a cause of syringomyelia. Minor's paper is a strong argument in favor of this view. He described five cases, one of which was confirmed by an autopsy, and the other four were so clinically similar that the diagnosis of central hæmatomyelia could be made without hesitation. In the four cases which were not followed by an autopsy no symptoms of fracture or dislocation were found, although all were traumatic cases.

Minor's cases presented a group of symptoms peculiar to syringomyelia, analgesia, and thermo-anæsthesia, with preserved sensation in three cases for touch, and less involvement in the fourth. Two of his cases presented the Brown-Séquard symptom-complex,—*i.e.*, motion affected on one side of the body and sensation on the other. A third case was almost of the same type, only both hands were involved in the changes of sensation.

It is instructive to notice how closely these cases of hæmatomyelia with the Brown-Séquard group of symptoms correspond to a case of syringomyelia of the same type, which had lasted for twenty years, presented by Raymond in his lectures at the Salpêtrière.⁴

Taylor⁵ also has described a patient of twenty-two years, who after a fall showed Brown-Séquard paralysis, with predominating disturbance of thermal sense on the side of the anæsthesia and preservation of the tactile sense. Hoffmann described a similar case, which developed probably from carrying a heavy load, and was with loss of sensation for cold on the side opposite the paralysis; in another one of his cases on the anæsthetic side cold was everywhere felt as warmth; in a third case the sensation of heat was lost.

Minor believes that the cases of syringomyelia which begin acutely are due to hemorrhage. Most writers acknowledge that the lesion of syringomyelia is multiple in nature,⁶ that the diagnosis is one of location rather than of nature of the process, and that while the symptoms are usually due

¹ Verhoogen and Vandervelde, *Journal de Méd. de Bruxelles*, 1893, No. 22; quoted by Brissaud, *loc. cit.*, p. 199.

² Oppenheim, *loc. cit.*, p. 235.

³ Minor, *Centrale Hæmatomyelie*, *Archiv f. Psych. u. Nervenh.*, vol. xxiv. p. 693.

⁴ See a short report in the *INTERNATIONAL MEDICAL MAGAZINE* for September, 1895.

⁵ Amer. *Journal of Neurology and Psych.*, 1884, p. 50.

⁶ *I.e.*, that the cavity-formation is not necessarily *limited* to one mode of development. "The term syringomyelia is, therefore, applied to all cavities in the cord with well-defined limits" (Gowers).

to the presence of a cavity, they may be equally due to a tumor in this position.

Thorburn describes a case of central hæmatomyelia, confirmed by autopsy, in which the vertebral column was not injured, but in none of his cases does he mention the syringomyelic group of sensory symptoms. When we recall the statement of Minor that central hæmatomyelia clinically is shown by muscular atrophy, with paresis, *analgesia*, and *thermo-anæsthesia*, with usually preserved tactile sensation, we are at a loss to understand the absence of this symptom-complex in Thorburn's cases of hæmatomyelia. Thorburn wrote his book in 1889, three years before Minor gave his description, and it may be that in the cases of the former care was not taken at all times to see if the sense of touch, although involved, was less so than the sense of heat or cold. Minor¹ has just reported three more cases of central hæmatomyelia not confirmed by autopsy. All three showed the dissociation of sensation, and one was of the Brown-Séquard type.

In the case we describe this group of symptoms was not present, perhaps because the patient lived only thirty-six hours, and certain symptoms were probably due to shock, and would probably have passed away if death had not occurred so soon, for the posterior columns were very slightly affected, and the change here consisted in a swelling of some of the axis-cylinders. If Gowers² is correct in his view that fibres of tactile and muscular sense remain in the posterior columns, and if the fibres for temperature and pain have a portion of their course in the central gray matter, as syringomyelia certainly seems to indicate, we can understand Minor's cases, and at the same time can appreciate the great diagnostic value for cases of central hæmatomyelia in the existence of such a symptom-complex. Certainly in every case of suspected central hæmatomyelia, which is the most common form, and in every case of spinal fracture sensation should be most carefully tested for all its qualities separately,—temperature, pain, touch, and muscular sense. Thus, Krafft-Ebing,³ in two cases with acute beginning of muscular atrophy, with disturbance of sensation, made the diagnosis of hæmatomyelia; in one of these cases where analgesia and thermo-anæsthesia were present he placed the hemorrhage in the anterior horn corresponding to the atrophied side and in a part of the posterior horn, and the two cases presented by Lloyd,⁴ in both of which dissociation of sensation was noticed, and in one of which the Brown-Séquard type was present, are considered by Minor,⁵ in greater part at least, as cases of central hæmatomyelia. Hoch⁶ also reports two cases of hæmatomyelia, one with dissociation of sensation. This case was also of the Brown-Séquard type.

¹ Archiv f. Psych. u. Nerven., vol. xxviii., No. 1.

² Gowers, loc. cit., pp. 195 and 198.

³ Krafft-Ebing, Wiener klin. Wochens., 1889, No. 49.

⁴ Journal of Nervous and Mental Disease, 1894, p. 345.

⁵ Archiv f. Psych. u. Nerven., vol. xxviii., No. 1 (foot-note).

⁶ The Johns Hopkins Hospital Reports, vol. ii. p. 351.

The remarks of Redlich and Schlesinger in the Wiener medicinische Klub, November 27 and December 4, 1895, are interesting. Redlich calls attention to the fact that not all cavities in the cord have the same significance and the same origin. He supports the theory of cavity-formation from trauma or hemorrhage in the cord, and states as a proof the presence of residue of the hemorrhage in the cavity. In a cord of a hydrocephalic child which he examined, he found a very enlarged central canal, from which a diverticulum passed into the posterior columns. At a higher level he found a cavity not in connection with the central canal and situated in the much degenerated posterior columns. This cavity appeared as true syringomyelia; in the lower dorsal region it was continuous with the central canal and the diverticulum mentioned. In the diverticulum, as well as higher up, where it appeared as a true syringomyelic cavity, fresh and old hemorrhage was found. He concludes that a hemorrhage had taken place in the diverticulum and had extended upward in the form of a column of blood. As labor had been very prolonged, he attributes the cavity to a hemorrhage occurring at birth and the hydromyelia to a later effect of the hydrocephalus. Schlesinger¹ remarked that this case explained the formation of cavities in atypical parts of the cord.

Schultze² has just published an interesting paper. He has examined the brain and cord in several cases of death of infants from difficult labor. He has found cavity-formation in the posterior horn in the upper dorsal region before any hardening agent had been used, and the appearance was that of syringomyelia. In the cervical and dorsal regions of the cord, hemorrhage was found in the posterior horns and not involving the central canal. In the centre of the hemorrhage the normal structure of the cord was greatly altered. The white matter was almost intact. In all three cases examined by him, hemorrhage was found in the gray matter. Schultze believes he has discovered the origin of many latent so-called congenital cases of syringomyelia. Often streaks of neuroglial tissue are found in the bulb, which cannot be explained by the theory of disturbance in development of the fourth ventricle. Schultze believes also that in children a complete reparation after such hemorrhages is possible, but it is likewise probable that tears in the tissue may remain, which become surrounded by neuroglial tissue, or the space may be filled with neuroglia, which proliferates later if any injury happens to the cord. It is even possible that such a cavity may become part of the central canal and be lined from it with epithelial cells. Schultze calls attention to the fact that congenital dementia, imbecility, and microcephaly (Dejerine) are frequently found with syringomyelia (Schlesinger, Hoffmann). These are conditions which often follow difficult labor. Can Schultze's recent discoveries explain these combinations? The investigations of Schultze were undertaken to explain the

¹ Wiener Med. Wochensch., Nov. 1, 1896.

² Schultze, Deutsche Zeitsch. f. Nervenhe., vol. viii., Nos. 1 and 2.

cause of cerebral diplegia, but he did not find the miningal hemorrhage spoken of by McNutt, Gowers, etc. These spinal hemorrhages may have been due to trauma during extraction, or to venous hyperæmia from asphyxia. In regard to these cases, Dr. Willard makes the suggestion that version so frequently practised would have an important bearing in the production of spinal hemorrhages, since violent traction is often made upon the after-coming head and neck. It is very striking that in Schultze's three cases the lumbar portion of the cord was free, for this is the part usually spared by syringomyelia. The mass of neuroglia around a cavity is sometimes small, and Schultze considers it difficult to explain such a cavity as due to the disintegration of gliomatous tissue. The first clear clinical descriptions of syringomyelia ever made were given by Schultze and Kahler (1882 and 1888), and the importance of these recent observations by one of the two men who have first taught us how to diagnose the disease during life is considerable.

The probability of central hæmatomyelia as a cause of syringomyelia seems great. Schlesinger (*loc. cit.*, p. 188) considers this as very probable, but not as yet proved. Minor discusses this in his paper already quoted. He quotes the hypothesis originated by Langhans and supported by Kronthal that syringomyelia may be caused by pressure on any part of the cord which interferes with nourishment and the circulation of the cerebro-spinal fluid. A hemorrhage in the centre of the cord caused by trauma, with consecutive development of a dense ring of tissue round about it, even with cavity-formation—the so-called hemorrhagic cyst—can after a certain time not only appear as simple syringomyelia, but can also be the point of origin of a central gliosis, according to the theory of Langhans. Such an origin is also possible, according to his view, when no trauma has occurred but where the hemorrhage has been spontaneous. Dexler has observed in dogs enlargement of the central canal above the lesion after compression (mentioned by Schlesinger¹). The distinction between hydromyelia and syringomyelia is a doubtful one, and not held by some writers, as Schlesinger especially has pointed out.

Cases of syringomyelia following fracture have been seen too frequently to be considered merely chance occurrences,—*i.e.*, fracture of the spinal column in a person who has already latent syringomyelia. Syringomyelia after traumatism has been established by the observations of Lockhardt Clarke, Strümpell, Oppenheim, Leyden, Stadelmann, etc., and Schlesinger² has considered trauma as one of the most important causes of central gliomatosis. We also have seen a few cases of syringomyelia in cords which previously had been damaged by vertebral fracture.

When we remember that central hæmatomyelia is not infrequent in cases of fracture or even of severe trauma, and that this spinal hemorrhage

¹ Die Syringomyelie, p. 189.

² *Loc. cit.*, p. 137.

must be liable to the same changes as cerebral hemorrhage, with the production of a cyst with at least somewhat thickened walls due to proliferation of the surrounding neuroglial tissue, and that these hemorrhages occupy most frequently the gray portion of the cord chosen by syringomyelia, and that sometimes they extend through a great length of the cord (Leyden, Minor, etc.), and that syringomyelia is not uncommon after vertebral fracture, the theory of hemorrhage as one of the causes of syringomyelia seems well grounded.

This case offers support to this view. Had the man lived, as was not impossible from the morbid changes present, although the chances were against a prolongation of life (see case recorded by Dr. Lloyd), the absorption of this extensive hemorrhage in the gray matter must have caused a cavity or proliferation of the neuroglia, and, as the fibres of the posterior columns were apparently nearly normal, the function of these columns would not have been greatly altered. There would have been symptoms present due to injury of the gray matter and the median portion of the lateral columns. There would have been at least partial paralysis of all four extremities, spastic in the legs, flaccid in the arms, muscular atrophy in the upper extremities, and probably the dissociation of sensation seen in syringomyelia, as muscular and tactile sense would not have been involved (Charcot, Gowers, etc.), on account of the almost normal condition of the posterior columns. Of course, a transverse myelitis might have followed such a lesion as this, but had this failed, the location of the injury would well explain the cases of syringomyelia which follow fracture. It is hardly necessary to add that it does not follow that every case of fracture when life is spared must lead to syringomyelia. Usually the cord is totally destroyed or nearly so at the seat of lesion, when examined years after the traumatism has occurred. Nor does this case imply that only a lesion so situated as this was is necessary for the production of syringomyelia after traumatism: investigations such as Dexler has made and other cases show that a transverse lesion may cause cavity-formation.

CLINICAL LECTURES.

ASTHENIC BULBAR PARALYSIS.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL.

BY JOSEPH COLLINS, M.D.,

New York City,

Visiting Neurologist to the City Hospital, Attending Physician to St. Mark's Hospital.

GENTLEMEN,—To-day I shall present for your observation and study a patient who has what I believe to be the typical symptom-complex of a disease which has but recently been added to the list of disorders of the nervous system,—namely, asthenic bulbar paralysis, bulbar paralysis without anatomical foundation, or myasthenia gravis pseudo-paralytica, for different observers have referred to it by each of these designations.¹

So far as we are able to determine, it was Wilks, in 1870, who first recognized the occurrence of this symptom-complex and made careful post-mortem examination.² He did not attempt to draw any clinical or semeiological inferences from his case, and looked upon it as an aberrant form of Duchenne's disease; nor did the report of the case attract particular notice. A few years later Erb presented to the Congress of Southwest German Neurologists the history of three cases, which we now see belong in this category, and which he believed illustrated a new, probably bulbar, symptom-complex.³ At that time Erb reported that he was unable to find anything similar to it in the literature, and, as his cases were clinical studies, no theories as to the probable morbid anatomy of the disease were advanced. And so the evolution of the disease of this clinical entity remained, until Oppenheim, ten years later, described a case which he had carefully observed and on which he had made an autopsy. The negative findings in the central nervous system on microscopical examination prompted him to describe it under the second title mentioned,—namely, bulbar paralysis without anatomical foundation. To this article of Oppenheim's must we date the beginning of the real literature of the disease. Shortly afterwards

¹ Murri's eponymic reference to the disease as Erb's disease (*Policlínico*, vol. ii. 1895) does not deserve consideration.

² Guy's Hospital Reports, vol. xxii.

³ Archiv für Psychiatrie, vol. ix. p. 336.

Eisenlohr,¹ Shaw,² Dreschfeld,³ Jolly,⁴ Goldflamm,⁵ Eichhorst,⁶ Kalischer, Bernhart,⁸ and Mayer⁹ made contributions to this and similar but more wide-spread conditions by the description of cases, followed by autopsies in some instances, in which the symptom complex was very similar to that described by the previous authors, and to which they gave the same or some other name. For instance, Jolly in referring to his case thought best to give it the third name,—viz., *myasthenia gravis pseudo-paralytica*, because this cumbersome designation suggested the striking clinical features. It was not, however, until a paper published by Hoppe, inspired by Oppenheim,¹⁰ in 1892, that the disease began to attract any attention. Hoppe's work was carefully done, and it soon received such apparently full corroboration from Goldflamm¹¹ that clinicians were at once on the lookout for analogous cases.

At the present time there are about a dozen cases on record in which post-mortem examinations have been carefully made. This, it is true, is a very small number on which to base conclusions concerning the nature and course of the disease, but as there are a very much greater number of cases that pursue a clinical course strictly analogous to those in which an autopsy has been made, it seems to me justifiable to present to you a clinical example of this condition, and to point out wherein it differs clinically from chronic degenerative bulbar paralysis or Duchenne's disease, which it simulates and for which it is naturally mistaken. And before saying further concerning the history of the disease I shall give you the important facts in the history of this patient.

She is twenty-seven years old, married, and the mother of two healthy children. She was born in Germany, is happily married, and has never known trouble or hard work. Her family history, as well as her personal history, is devoid of interest from our stand-point. After her first confinement a laceration resulted, for which it was necessary to do trachelorrhaphy. After that she was very well.

The first time at which there were any symptoms which we may connect with her present disease was about three years ago, when six months pregnant of her youngest child, who is now two and one-half years old. She says that she had been complaining of some weakness in the extremities, but not at all severe, and one morning on arising found that she

¹ *Neurologisches Centralblatt*, Nos. 15 and 16, 1887.

² *Brain*, vol. xlix., 1890.

³ *Brit. Med. Journ.*, July 22, 1893.

⁴ *Berliner klinische Wochenschrift*, 1891, No. 26.

⁵ *Neurologisches Centralblatt*, No. 7, 1891.

⁶ *Corresp. Blatt. f. Schweizer Aertze*, 1889, p. 432.

⁷ *Deutsches Zeitschrift f. Nervenheilkunde*, vol. vi. 1895.

⁸ *Neurolog. Centb.*, 1892, p. 189.

⁹ *Ibid.*, 1894, p. 338.

¹⁰ *Berliner klinische Wochenschrift*, p. 332, 1892.

¹¹ *Deutsche Zeitschrift f. Nervenheilkunde*, vol. iv. p. 312, 1893.

could not open the left eye. When she lifted the left lid she saw double. For this she consulted Professor Knapp. Through the courtesy of the latter I have had an opportunity to examine the notes of her condition made at that time. Aside from the ptosis, myopia, and a small central macula on the cornea, no deviation from the normal could be made out. The ptosis and doubling and tripling of visual objects were looked upon as hysterical. After two or three months the ptosis disappeared rather abruptly, but the diplopia recurred at times. Three or four months after the birth of her last child she experienced a very similar state of affairs with the right eye. After the ptosis lasted for about eight weeks it disappeared rapidly. During the past two years she has at times been treated for catarrh. I mention this here because it has some bearing on her disease, as has also her statement that there were times when she could not articulate clearly, a failing which she attributed to loss of a number of front teeth.

This was her history when she came to me on the 27th of February, 1895. She then complained of difficulty in speaking and articulating, of fatigue on chewing food, and inability to swallow as well as she ought to, and of a sensation of weakness, almost complete inability to use the extremities,—a symptom to which the name *amyosthenia* is applied. This feeling of weakness and fatigue was sometimes greater in the legs than in the arms, sometimes greater in the face than in the extremities; but, as a rule, it was fatigue of the parts concerned in speech, in mastication, and in swallowing. Sometimes she found the greatest difficulty in going up-stairs, in stepping from the curb onto the pavement, in raising her hands to dress her hair, or anything that required muscular effort. Associated with this there were palpitation, a fluttering sensation in the stomach, a feeling of weakness and pain in the back, and a history of excessive menstruation. She says that she may be walking along the street when suddenly the heart begins to flutter, the strength to leave the legs, and she feels that she must sink down if some one does not hold her, although there is nothing resembling syncope or unconsciousness. She has no morbid fears, no dreads, she does not complain of any perverted sensations, she does not have crying spells, and her *morale* is moderately stable. She is, however, restless, irritable, easily disturbed, and has what she calls “inward nervousness.” At such times, as well as at others, she cannot speak; the tongue feels heavy, unwieldy, and does not respond to volition. Also at such times, and at others, she cannot swallow; solids are particularly hard to get down. The vegetative functions are performed rather perfunctorily; sometimes she suffers but little from indigestion, while at other times, particularly at those periods when she says she is exhausted or irritated, there is nausea, borborygmus, and severe dyspepsia.

Examination at that time showed that the pupils contracted to light and in accommodation; that there were no objective evidences of paresis of the ocular muscles; that the innervation of the facial nerve, although sluggish, was alike on both sides; that the tongue could be protruded, and turned in

all directions, but that after it had indulged in these movements for a few minutes it grew more unwieldy, and had to be drawn into the mouth. There was no sign of atrophy in the tongue or in the lips. The lips could be puckered, a whistling sound could be made, and efforts at coughing were attended by the production of a tone. But all these exercises fatigued the patient, and after a few efforts their execution became less satisfactory. Myotatic irritability seemed to be normal all over the body, but it was distinctly remarked that the knee-jerk became exhausted on repeated testings. There was considerable tremor of the hands, and some of the face.

The patient was put upon a kind of rest plan of treatment, and particular attention paid to feeding and the application of hydrotherapy. Four months later she considered herself very well: she had gained twelve pounds in weight, she was not nervous nor excitable, nor did small things annoy her. She slept well, and, unless she did too much housework, talked too much, or walked too much, she did not feel the amyosthenia of the legs, of the arms, or of the face. The improvement in voice, swallowing, etc., seemed to be commensurate with the improvement in other parts, but the tongue was never lively, nor speech entirely normal, nor swallowing so perfect as before. This favorable progress continued until about the end of August, when she was feeling very well. She went on an excursion, and the next day fell ill with an acute follicular tonsillitis, and in two or three days she was reduced to her previous condition. She could scarcely lift the arms above the head, because, she says, they were so tired and played out. On attempting to talk, the first few sentences or the first few minutes of indulgence would be attended with moderately distinct speech. After that the tongue became heavy, the lips unwieldy, the voice hoarse, weak, and nasal, and finally she would have to cease talking on account of these obstacles. When she attempted to chew solid food the sides of her face would become very fatigued, and after she had succeeded in chewing it a few efforts of swallowing would reduce that function to almost complete inability, or, as she expresses it, "as soon as I talk very much my mouth gets lame, my tongue gets heavy, as if I had a piece of lead in my mouth, and if I do not stop trying, a distressing nervous feeling takes possession of me." On attempting to swallow fluids rapidly they regurgitate through the nose. When she attempts to read the paper or look for a time at any fixed object the eyes get tired and the upper eyelids fall. The record of the examination at that time shows a very similar condition, but of greater severity, to that when she was first examined. A note made at this time says that on some days she feels fairly well, and this may last over a period of some length, and then be followed by a sort of relapse. The annotation at this time also indicates that there was no atrophy of any part of the body, but that on the application of the faradic current to the tongue, to the lips, to the muscles of the extremities, and to a point just above Adam's apple, although in the beginning attended by a contraction, the irritability of these parts was soon exhausted.

Such, gentlemen, is her history. You will see that the salient features are practically those indicative of some lesion of the nuclei in the medulla, and a loss of tone or of integrity of other constituents of the medulla, such as conducting pathways or the structures from which they originate. The course of her disease has been characterized by periods in which she has been very well, followed by periods in which she has had symptoms of extreme severity.

After the last exacerbation which we have just mentioned, a period of cessation of the symptoms and bettering of her entire condition followed, which in turn was succeeded by a relapse more serious than any heretofore experienced, and it is in a partially recovered condition from the last relapse that I now show her to you. She reports to-day that she is feeling rather well. Three months ago, the time of her last relapse, she says that one evening she was talking with some friends in her own house, when suddenly she felt a twitching sensation in the right temporal and facial region, which was soon followed by one of these complete exhaustive conditions all over the body. When she awakened the next morning she felt that there was something wrong with one side of the face, and on looking into the glass noticed that the mouth was pulled to one side. This facial paresis lasted but a few days. The records of that attack show that the symptoms were similar to those already referred to in some detail, except that in this one there were added symptoms of much greater severity, such as painful attacks of tachycardia, attacks of dyspnoea, and a feeling of extreme weight on the thorax, both of which were accompanied by extreme prostration. Bad symptoms continued for a long time, and then amelioration set in slowly, and has resulted in her present condition. She is now able to walk, providing she does not overtax her strength in that direction too severely; she is able to sit up most of the day, she can swallow liquids, she can talk, and she can read, providing all these are done with moderation. As you see, her nutrition and her color are fairly good. You will notice that her facial expression, although not a striking one, arrests your attention. The upper part of the face does not seem to be properly innervated,—that is, there is less expression about the forehead and the eyes than there is normally, and the lower part has a flaccid appearance. You will notice when I ask her to close the eyes that it is impossible for her to squeeze the eyelids tightly together, and by the slightest effort I am able to force them apart. The muscles which move the eyeball do not betray any paresis on rough examination, although she tells us that at times she sees double. I have not recently had a careful examination made with prisms. The lips are not closely pressed together, and although she is able to pucker them, she cannot for long hold them so, nor is she able to whistle. When she endeavors to press the mouth firmly together I succeed easily in pressing the lips apart. The tongue can be protruded and turned in all directions, but it soon gets fatigued, and there is, as you see, no evidence of atrophy. When the patient speaks the voice is nasal,

high-pitched, whining; in the beginning it is of moderately good tone and speech is articulated, but she tells us that continuous efforts at speech are very exhausting and quickly incapacitate her for this purpose. You will notice also that the labials and consonants become articulated very imperfectly, until some of them, like *b*, *p*, *q*, *v*, etc., are scarcely to be distinguished. There is some tremor, but no ataxia, of the hands; and although movements of the upper extremities are free in all directions, the arms soon become tired if they are held out, or particularly if they are held above the head. The reflexes are, when first tested for, apparently normal, but you are able to corroborate what I have already said,—that after striking the patellar tendon a number of times in succession the arc through which the foot moves gets very much less, until there is no response. I assure you, however, if sufficient time were given us to wait until the reflex mechanism at the bottom of this reflex had recovered, we would be able to demonstrate a knee-jerk quite as good as you saw when I first tested it here. I assure you, further, that the direct and indirect application of the faradic current to the muscles of the extremities, of the tongue, and of the face produces a somewhat similar condition of exhausted irritability as the knee-jerk does. This I do not wish to demonstrate to you, as I consider it extremely detrimental to the patient, and indeed may do irreparable injury. You must, however, bear in mind that the electrical irritability is preserved.

Let me now call your attention to a few symptoms which this patient does not present, but which are almost always present in true degenerative bulbar paralysis. In the first place, there is no drooling, or drivelling of saliva; there is no real atrophy of the muscles, neither of the tongue, of the lips, nor of the extremities. The muscles of the extremities may be of slightly smaller volume than formerly, but there is no degenerative atrophy; there are no fibrillary twitchings; the deep reflexes are present, and electrical irritability is preserved. There are no disturbances of sensibility, either objective or subjective, and the special senses are unaffected. One fact in reference to the latter I must call to your attention in this connection. I have noticed that continuous or prolonged stimulation of some of the special senses in this patient, particularly the sense of sight and of hearing,—for they have been the ones most easily tested,—are quickly exhausted. Then, involvement of the third nerve, the lower facial, and the minor branch of the fifth nerve are all evident in this case, and they are rarely, if ever, found defective in function in cases of true bulbar paralysis.

So, then, if we briefly recapitulate the symptoms as they have developed in this case, we find that at first there was an indefinite feeling of easily-induced fatigue and of rapid exhaustion, particularly in the speech and swallowing mechanism, as well as in the extremities. The first real symptom was ptosis, first on one side and then on the other, associated in both instances with diplopia, indicating involvement of the third and perhaps the

sixth nerve, although the movements of the eyeballs remained unrestricted. It has been noticed in other cases, particularly in the one reported by Strümpell,¹ that even when the diplopia is pronounced no deviation in the ocular muscles can be made out objectively. When objective symptoms are present they are symmetrical on both sides, and often disappear abruptly after shorter or longer duration. Following this there was weakness of the muscles of mastication, pointing to the motor fifth; defect in articulation and in vocalization, pointing to the ninth and tenth nerve; and unwieldiness and sluggishness in action of the tongue, pointing to involvement of the twelfth nerve. In addition to all this, there have been attacks of distressing tachycardia and paroxysmal dyspnoea, weakness and feeling of exhaustion in the trunk and extremities, true amyosthenia of all the motor parts of the body.

The strictness with which the symptoms have confined themselves to the motor sphere is a striking feature of the disease in this case, as it is in all others reported. In a few instances slight paræsthesiæ have been mentioned, but the rule is that cutaneous and deep-seated sensibility are intact; the sphincters are undisturbed, and vasomotor and trophic disturbances do not occur. Likewise, it has been noted by all observers that the psychical faculties remain normal, as they have in this patient. You have observed that the ciliary muscle which controls the pupil is not affected, nor is accommodation. The involvement of the seventh nerve has been manifested in this patient by the fatigue of the muscles which express the emotions, and particularly by the attack of facial paralysis of which we have already spoken. Affection of the seventh nerve has not been noticed in all cases, but generally there is a slight amount, which gives a characteristic relaxed expression to the lower part of the face, and adds materially to the difficulty of speaking and labial prehension.

The changes in the voice which the patient presents, and the tendency which fluids have to regurgitate through the nose, are dependent, in part at least, upon defective activity of the soft palate, and the former, at least partly, upon trouble in the innervation of the vocal cords. Exact observations have not yet been made on the condition of the vocal cords, or, better, their muscular attachments, in this disease, but it is probable that in some cases they are paretic,—a condition that was found in one of Hoppe's cases.

Thus, gentlemen, you have observed that, though the clinical picture in its *tout ensemble* is at first sight very much like degenerative bulbar paralysis, or the glosso-labio-laryngeal paralysis of Duchenne, when you examine closely into the case you find that it differs radically from the latter disease in several most important features; these features I have pointed out to you in passing, and I shall not take the trouble to repeat them.

It is, however, in the pathology and morbid anatomy of the disease

¹ Deutsch. Zeitschr. f. Nervenheilk., vol. viii. pts. 1 and 2, 1895.

that the surprising feature of the disease is shown. In every case in which a careful microscopical examination of the central nervous system has been made, the findings have been entirely negative, and up to the present time such examinations have been made in the cases of Wilks, Oppenheim, Hoppe, Eisenlohr, and Strümpell. In the beginning reports of cases in which the symptoms had been so well marked as in this disease, and of such severity that they led to death, and in which no pathological condition could be found by the microscope, were looked upon with a great deal of scepticism, and, indeed, there were those who did not hesitate to say that the negative anatomical findings may have been due to the fact that a normal specimen got exchanged in some way for the diseased one in the laboratory, and thus the mistake arose. The corroboration of all subsequent observers of the negative findings of their predecessors has entirely annihilated this and all other suspicions as to the reality of the condition.

You do not need to have your attention drawn to the striking and constant morbid changes that are found in the nests of ganglionic cells in the medulla, along the floor of the fourth ventricle, in degenerative bulbar paralysis. The morbid anatomy of that disease is better understood than almost any other degenerative disease of the nervous system. What a contrast between that and the one that I have attempted to depict for you! Here is a disease that resembles it in all its superficial features,—one that wears the mask of it, we may say,—and one that is of such severity that it often leads to death more quickly than the organic form of bulbar paralysis; yet when the ganglionic cells of the medulla and of the pons are examined after death no departure from normal can be made out. I have not the time to cite for you the theories that have been postulated to explain the occurrence of this disease, and if the time were mine, the inclination would be lacking. It would seem, however, that the unanimous opinion of those who have had anything to say on the matter is that the disease is caused by the presence in the system of a poison, of exogenous or endogenous origin, which manifests its peccant action on groups of ganglionic cells exclusively motor in any part of the nervous system, but by preference those of the medulla and of the pons. That this manifestation may be a continuous one in the shape of inhibition of function; that it may, however, and is very apt to be, an intermittent one, the intermittency being coincident with a cessation of action on the part of the poison, or with an ascendancy of the recuperative powers of the system to cope with it. So we might go on and weave other webs of theory, but I cannot see that they would be of any service to you, and might dim your perspective of the disease as it has been put before you clinically. I have said that the symptoms of the disease, although they may indicate involvement of the ganglionic cells of the medulla alone, often postulate an affection much more extensive and wide-spread, as I may say they have in the case before you, in which symptoms of fifth- and third-nerve involvement must be explained by affection of their pontal nuclei.

Cases of this kind have been reported by Dreschfeld, Goldflamm, Pineles (*Jahrbücher f. Psych.*, vol. xiii. pp. 2 and 3), and others, in which the symptoms are those common to polioencephalomyelitis, while in others they were those of combined superior and inferior polioencephalitis. In these cases, the same as in those in which the disease manifestations could be explained by involvement of the groups of cells in the medulla, no post-mortem condition has been found to account for the symptoms.

In Dreschfeld's case the symptoms came on with double ptosis, which recovered. Six months later there was recurrence of the ptosis, and, in addition, diplopia, bulbar symptoms, weakness of the arms, and before long paralysis of all the cranial nerves and upper cervical nerves. Some of the affected muscles underwent atrophy, but electrical irritability remained normal and there were no sensory disturbances.

Before closing I wish to say a few words concerning a condition which you may be called upon to differentiate from this disease, and also to speak briefly of the treatment of so-called asthenic bulbar paralysis. The differential diagnosis from cerebral pseudo-bulbar paralysis must always remain a difficult one, as in both there is absence of atrophy in the paretic muscles, and in both the symptom complex may be only atypically that of true bulbar paralysis. Cases in which there is a history of one or more attacks of hemiplegia, it matters not how suggestive other symptoms may be, cannot be admitted into this category. It is for this reason that a case reported recently by Senator (*Neurolog. Cent.*, No. 6, 1892) cannot be considered as belonging to this group. The differential diagnosis from associated neuritis of the bulbar nerves will rarely have to be made, but when it does the presence of reaction of degeneration will be of greatest importance. Bear in mind that the latter does not occur in asthenic bulbar paralysis. The possibility of hysteria and Basedow's disease in an aberrant form must be considered.

Nothing is really known of the causation of asthenic bulbar paralysis. Of the cases reported the majority have been under the age of thirty. It has been observed in a case of profound chlorosis, and the possibility that it is dependent upon a chronic intoxication of exogenous or endogenous origin has already been suggested, and the course of the disease and the development of the symptoms lends itself and is in full accord with this view.

The treatment which common sense suggests is to put the patient in a position as favorable to complete rest as possible, and then by the careful and judicious use of restoratives and foods to improve the patient's nutrition, while at the same time every possible measure is taken to prevent unnecessary expenditure of energy. The means to adopt to secure these will readily suggest themselves to you. One word about feeding the patient. As I have said, not infrequently after the patient swallows a few times the power to swallow becomes very weak, and care should be taken not to exhaust the function of deglutition at any one time. Artificial feeding by means of

the stomach-tube should not be resorted to, as the movements of regurgitation produced by the passage of the tube are more exhausting to the patient than is the act of swallowing artificially masticated and liquid food. Oppenheim warns against the use of electricity to produce muscular contraction, but recommends central galvanization, and I am sure that his advice has been of service to me in the treatment of this patient. I think also that I have seen the good effects from the hypodermic use of strychnia in this case, although such experience is contrary to that of several others who have employed it. Jolly mentions the possibility of using veratrine to good advantage, but advises that it be tried with extreme caution. This patient has reached her present satisfactory condition, although it is far from cure, aided by hydrotherapy, central galvanization, small doses of strychnia, and by the most careful attention to the laws governing the maintenance of nutrition. Considering the bad prognosis of the disease, the average duration being from two to four years, the result is encouraging. I ought to say that examples of complete recovery have been cited by Goldflam and others.

SOCIETY REPORTS.

DOCHMIUS DUODENALIS AS A CAUSE OF ANÆMIA IN BARBADOS.

PAPER READ BEFORE THE BARBADOS BRANCH OF THE BRITISH MEDICAL ASSOCIATION,
FEBRUARY 13, 1896.

BY CUTHBERT BOWEN, M.A., M.D., F.R.M.S.

MR. PRESIDENT AND GENTLEMEN,—Cases of intense anæmia frequently present themselves in our wards with such aggravated symptoms that I have been forced to the conclusion that something beyond the usual causes assigned for its production must often lie at the bottom of the condition. A few days ago my colleague, Dr. Clarke, asked me to witness the *post-mortem* of a young woman who had died with symptoms of dysentery which had resisted all his treatment. In examining the inverted intestinal canal in its entirety, I discovered, adhering to the mucous membrane of the duodenum, several tiny specimens of round worms, two of which you have presented for your inspection this evening. The sexes are clearly distinct. The specimens are therefore diœcious and not hermaphrodite. You will notice that one of the specimens is eighteen millimetres in length and has a

pointed extremity, while the smaller of the two is only twelve millimetres and posteriorly terminates in an expanded umbrella-like bursa, along the margin of which we observe a number of digitated papillæ, and projecting from the bottom of this corolla-like expansion a hair-like double penis is seen. It is very evident that we have before us one of the strongylidæ belonging to the order of nematodes. The nemathelminths contain but two orders, the nematoda and acanthocephala. Our specimens clearly do not belong to the acanthocephala. We do not observe any protrusible proboscis at their anterior end, but a quadrilateral oval orifice armed with eight teeth. In one of the specimens you will notice that some of the teeth have been torn off from being forcibly detached from the mucous membrane. It is very clear to my mind that the specimens before us are the male and female *dochmius duodenalis*, and that we must add Barbados to the list of localities in which this nematode occurs.

That the condition known as anchylostomiasis must be prevalent in this island is evident from the fact that a few days after obtaining these specimens I made a careful search of the stools passed by the next case of anæmia which presented itself, from an entirely different part of the island, and obtained a large number of eggs, the characteristics of which are in accordance with those of the anchylostomum. These ova, as you see, are somewhat like those of the *ascaris lumbricoides*, but much smaller, while they are slightly larger than those of the *oxyuris vermicularis*. The eggs of the *oxyuris*, which I show you on another slide, have one of the laminæ wanting at one pole, and within the ovum you observe an embryo developing. In the eggs before us you will observe the contents have undergone segmentation, but there is no trace yet of an embryonic formation. The administration of vermifuges and purgatives in this case was attended with the expulsion of large numbers of these worms, and their recognition is so simple that I feel we owe the public an apology for allowing their presence to have hitherto escaped our notice in Barbados.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSÉ, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory,

A Case of Diabète Bronzé, with Autopsy. (*Semaine Médicale*, p. 229, 1895.) By Dr. Pierre Marie, of Paris.

The patient was a man of fifty-one years. Until his fortieth year he had had excellent health, but at this period he commenced to use alcohol to excess and had a severe attack of bronchitis. Six years later an abscess formed upon the right arm that contained dark and offensive pus, four years after this, in December, 1894, a fortnight after an attack of grippe, he noticed œdema of the legs, distention of the abdomen, increase in the quantity of urine and the frequency of micturition, and some increase in appetite. From this period the skin became gradually darker. His condition in March, 1895, was as follows: extreme emaciation of the face and limbs, distention of the abdomen with slight ascites, increase in the size and consistency of the liver and spleen, with some tenderness upon percussion. His subjective symptoms were nightmare, formication, fulgurant pains, and a sensation of heat in the legs. The knee-jerks were absent. The urine was dark and contained considerable sugar. The skin was dry and of a bronze color, particularly upon the face, hands, and genitalia. The patient was weak, had moderate polydipsia and polyphagia, suffered from slight discomfort an hour after meals, constipation alternating with diarrhoea, and when the abdomen became distended from dyspnoea. He also complained of persistent insomnia. The diurnal quantity of urine varied between two and a half and three and a half litres, and the quantity of sugar, between forty and fifty grammes. Later a lymphangitis appeared upon the lower part of the abdomen and the cutaneous veins became much distended. The signs of tuberculosis developed in both apices and caused a slight elevation of the otherwise subnormal temperature. In the latter part of April, six days before death, the urine was free from sugar. Marie finds that only eleven cases of pigmentary hepatic cirrhosis have been recorded, all presenting very nearly the same symptoms. The clinical characteristics of the disease are as follows. It occurs in adult life between the ages of forty and

sixty years, chiefly in men. Alcohol appears to be the only likely cause, although malaria has been suggested. It sometimes follows a prolonged attack of bronchitis. It commences usually with dryness of the mouth, polydipsia, polyuria, and diarrhœa. The amount of sugar found in the urine is very variable, and this is true both of different cases and of different periods in the same case, but it is usually moderate and diminishes as death approaches. The abdominal symptoms are tympanites with but slight ascites, hypertrophy and increased consistency of the liver, and tenderness over the hepatic region. The spleen is enlarged, the cutaneous abdominal veins are distended, and in several cases a lymphangitis has developed in the skin of the abdomen. There is a slight subicteric coloration of the skin, and the urine is dark, but probably not from bile pigment. Digestion is retarded and frequently there is diarrhœa. The rapid emaciation, the extreme weakness, and the œdema of the lower extremities contribute to give the appearance of cachexia that is so frequently presented. Finally, the cutaneous pigmentation is characteristic. It involves the whole body, is darker on the face, hands, and genitalia, and nowhere shows any tendency to spots or blotches. The mucous membranes are not affected, and it differs in this respect from Addison's disease. The coloration itself varies from a clear brown to a grayish-black shade with an almost metallic lustre. In a very few cases the pigmentation has been absent. The prominent nervous symptoms are the insomnia, the loss of sexual power, and the absence of knee-jerk. The course of the disease is rapid, death usually occurring in about a year, with extreme limits of five months and two years. The preagonal symptoms are increase of the œdema, with sometimes the appearance of a purpuric eruption; elevation of the temperature, perhaps due to pulmonary tuberculosis, which is frequently present, or to peritonitis; and the disappearance of the sugar from the urine. Marie found the following morbid lesions in his case. The liver was very dark and hypertrophied, the intestines were of a blackish color; the peritoneum was studded with miliary tubercles; the spleen was hypertrophic and sclerotic; the mesenteric glands were of a rusty color, the pancreas was sclerotic, and there was brown atrophy of the heart and tubercular nodules in both apices. Histologically the liver showed extreme sclerosis and pigmentation. The cirrhosis was peculiar in that fibrous bands proceeded from the hepatic as well as from the portal veins and caused the subdivision of the lobules. Sclerotic changes with pigmentation were found in the pancreas, and more or less pigment in all the organs. The amount of pigment in the muscular fibres of the heart was very considerable. According to the theories of MM. Hanot and Chauffard, the cells of the liver, under the influence of the hyperglycæmia and the insufficient circulation caused by the diabetic endarteritis, elaborate this pigment; but Marie agrees with Letulle, that if this were true, the cells should show some evidence of hyperactivity, and this is not the case. According to MM. Brault and Galliard, the pigment is the altered hæmoglobin of the blood that the diseased hepatic cells were

unable to destroy. The pigment is unquestionably ferruginous, and the percentage of iron found in the pigmented organs was considerably in excess of the normal, in the spleen 4.2 per cent., in the liver 11.3 per cent., in the lymph-glands 18.5 per cent. Everywhere the organs gave the characteristic reaction with ammonium sulphide; but Marie was not satisfied that the pigment existed in the blood itself. Manifestly, however, there is but one source in the body adequate to supply this enormous amount of iron,—namely, the hæmoglobin. Marie therefore concludes, with Letulle, that the hæmoglobin plays the principal part in the pathogenesis of diabète bronzé, and describes the course of events as follows: “Dissolution of the hæmoglobin of the blood, under the influence of some primitive cause; transformation of the hæmoglobin into pigmentary granules under the influence of the cellular protoplasm of the organs, exaggerated elimination and accumulation of the pigment in the organs by the irritation and consecutive atrophy of the cells, supplementary elimination of the pigment by the lymphatic channels, from which arise both sclerosis of the interstitial connective tissue and pigmentary infiltration of the ganglia.” He insists that this is not a variety of hypertrophic cirrhosis with pigmentation nor of ordinary diabetes mellitus; but he prefers to consider it as a specific disease, having perhaps a closer affinity to pancreatic diabetes than to any other form.

Diabète Bronzé. (*British Medical Journal*, January 25, 1896.) By Victor Hanot, M.D., of Paris.

The difficult problem in this disease is to explain the origin of the pigment. Hanot and Chauffard originally believed that it was due to a pigmentary hypergenesis of the hepatic cell resulting from its stimulation by the glycosuria. Letulle, however, believes that it is formed in the degenerated cells themselves; as, in the cells of the liver, he always found the greatest amount of pigment in those that were most degenerated. Brault and Galliard hold that it is the pigment normally formed in the blood, but that the altered hepatic cell cannot absorb it, and hence it is taken up by the other cells of the organism. Mossé holds that it is developed in the blood-vessels at the expense of altered hæmoglobin. Masary and Potier consider that changes in the liver are essential to pigmentation, but that the separation and deposition of the pigment take place in the organs themselves. Hanot recently observed two cases, one of which was an alcoholic, from the incipency of the disease, when only glycosuria was present. While under his charge both rapidly developed hepatic hypertrophy, melanoderma, and cachexia, and he considers these to be the equally important consequences of one and the same course. The melanoderma is most pronounced upon the face, limbs, and scrotum. Regarding the morbid anatomy, the liver is dense and of the color of rust or old untanned leather, the surface is smooth and the biliary ducts unaffected. The glands of the intestines are slaty black. The spleen is indurated, en-

larged, and rusty, and the mesenteric glands are sometimes of the same color. The Malpighian layer of the skin is infiltrated by an ochre-colored pigment that contains a salt of iron, and is distinct from the pigment of melanotic sarcoma and Addison's disease. Death usually occurs during coma, or from septic pneumonia, following diabetic gangrene. Hanot agrees with Marie that the disease is a distinct morbid entity.

Diabetes Mellitus in Early Infancy. (*Edinburgh Medical Journal.*)
By W. B. Ball, M.D.

The patient, a well-nourished male, was first seen at the age of three months and five days. He was fretful and restless, and seemed to suffer from intense thirst. The genitalia and thighs were covered with a weeping eczema. The child had always seemed healthy, but for a month past it had exhibited a great desire for liquids. The urine was in excess, of a clear color and sweetish taste, and contained a large amount of sugar. Four days later the symptoms were about the same with the addition of drowsiness. This increased, the child became comatose, and died seven days after the first visit. The autopsy was negative. An interesting feature is the fact that an aunt on the father's side had died of diabetes mellitus. The only treatment used was putting the mother upon antidiabetic diet, apparently without effect. [Ball insists upon the excessive rarity of diabetes in infancy, but it might be urged that it is very rarely suspected, and that the urine of young infants is practically never examined.]

The Function of the Suprarenal Bodies. (*Wiener medicinische Wochenschrift*, November 7, 1895, second part.) By Professor N. Cybulski, of Krakau.

The active principle of the suprarenal bodies passes through the membrane of a dialyzer and through the Chamberland filter. It is not altered by boiling, but boiling the gland prevents its extraction. It is probably, therefore, a crystalloid. It is possible to accustom an animal to its toxic action so that massive doses may be injected without effect. Large doses, or frequently-repeated small doses, cause respiratory failure, but if artificial respiration is continued for some time, the animal recommences to breathe of itself. The urine or blood of animals to whom a considerable amount of the extract has been given is toxic. Oxidizing agents, such as permanganate of potassium, completely destroy this action in all solutions. Cybulski believes the medullary centres governing the heart, the respiration, and the vasomotor system are continuously stimulated by a substance elaborated in the suprarenal bodies, and that this is the only regular stimulant to these centres. This substance is actually found to exist in the blood coming from the glands, for if this be injected into rabbits, cats, or dogs, the characteristic slowing of the pulse, increase of blood-pressure, and acceleration of respiration always occur. Moreover, if both suprarenals have been extirpated, dyspnoea causes no rise of blood-pressure nor acceleration of the

respiration, but both take place as soon as some of the extract is injected. [Clinical experience accords only partially with these results, for it seems to be conclusively established, that disease of the suprarenals causes more pronounced disturbances in the blood than in any other tissue.]

Experimental Addison's Disease in the Sewer-Rat. (*Gazette des Hôpitaux*, February 13, 1896.) By Professor Ed. Boinet, of Marseilles.

Both suprarenal capsules were removed in one hundred and nine rats, both were ligated in twenty, and various irritants were used in another series to produce inflammatory changes in them. In half of these animals a black pigment was found in considerable quantity in the blood, similar to that found in the tissues of two cases of Addison's disease; in one-fourth of the cases it existed, but in less quantity; and in the remainder it was not found. The subcutaneous cellular tissues, the mucous and serous membranes, and the lymphatic glands were considerably infiltrated with pigment in certain rats examined some months after the operation; and this infiltration was most pronounced in three rats that had been subjected to the exhaustion of constantly-repeated electric shocks. The rats sometimes exhibited symptoms of asthenia and paresis. In one case the gland exhibited the typical cheesy degenerative change of Addison's disease. The extract of the muscles of the Addisonian rats was very poisonous, causing death in a normal rat in three days, and a much smaller quantity killing a rat, whose adrenals had been removed four days previously, in a few hours. This toxicity is increased by producing a state of exhaustion in the animals.

Extreme Cirrhosis of the Liver in a Boy. (*British Medical Journal*, February 22, 1896.) By W. Rushton Parker, M.A., M.M.

The patient, a boy, began at the age of twelve to suffer from diarrhœa, followed by jaundice, and later ascites, hæmatemesis, and melæna. The urine was loaded with urates and bile pigment, but contained no albumin. The stools varied from white to the natural color. The gums were usually swollen and inclined to bleed; and after an attack of hæmatemesis, a petechial eruption and anasarca appeared in the lower limbs. The heart and lungs were normal, but the area of liver dulness was much reduced. Antisyphilitic treatment was without effect. The autopsy revealed a liver one-third the normal size, hard and hobnailed, the spleen was twice the normal size, and soft and pulpy; the kidneys were normal; the cæcum and colon much inflamed. No cause could be discovered except moderate indulgence in rum by the father for a year or two before the boy's birth.

Some of the Symptoms Consecutive to an Experimental Nephritis. (*Comptes-Rendus de la Société de Biologie*.) By MM. J. E. Abelous and E. Bardier, of Toulouse.

An acute nephritis was caused by the application of a solution of nitrate of silver (1:10 or 1:15) to the surface of one or both kidneys. In either

case, in about twenty-four hours after the application, and while oliguria and albuminuria were present, marked respiratory disturbances occur that have a tendency to become periodic (Cheyne-Stokes phenomenon). If one kidney was first acted upon, and then, after complete recovery, the other was similarly treated, neither albuminuria nor respiratory disturbances occur. No explanation is offered for this curious result.

Eruption in Alcoholic Cirrhosis. (*Comptes-Rendus de la Société de Biologie.*) By U. Monnier, M.D., of Nantes.

Just before death, in a case of atrophic alcoholic cirrhosis, a papular eruption appeared upon the skin. This then became vesicular, bullous, and finally hemorrhagic. Cultures made from the contents of the bullæ developed the bacterium coli communis and the streptococcus, both cultures being virulent. The author arrives at the following conclusions: 1. A form of cutaneous bullæ may occur in the terminal stage of atrophic alcoholic cirrhosis. 2. One of the causes of this may be infection. 3. The bacterium coli communis and the streptococcus may cause hemorrhagic effusion.

Two Cases of Subcutaneous Abscess developed in the Course of Severe Pleuro-Pneumonia. (*Bulletins et Memoires de la Société Médicale des Hôpitaux de Paris.*) By MM. Louis Guinon and Gustave Bureau.

Among the extra-pulmonary lesions produced by the pneumococcus, those of the skin are the least frequent. That they should occur as complications of pneumonia it is necessary that some local predisposing cause should exist, such as a traumatism. The two cases reported presented the following common features: slow resolution, incomplete defervescence, interrupted by the development of a purulent pleurisy, which, in both cases, required resection of the ribs. During the course of the disease, as well as during the collapse following the resection, it had been necessary to give hypodermic injections of benzoate of caffeine; and it was from the points of these injections that the abscesses developed. They varied in size from that of a small nut to a cavity containing five hundred grammes of pus. After incision all healed very rapidly, the smallest in forty-eight hours, the largest in eight days. In the first case they were found upon the fore-arms, and in the region of the right trochanter; in the second, upon the anterior surface of both thighs. All contained exclusively the pneumococcus, as was proved by microscopical examination, by cultures, and by inoculation in mice. The cases show that the diplococci retain their virulence after the pulmonary process has ceased, and that they certainly circulate in the blood or other fluids, awaiting a local weakening of the tissue in order to develop.

A Case of General Infection by the Bacillus Pyocyaneus. (*Montreal Medical Journal*, March, 1896.) By Kenneth Cameron, B.A., M.D.

The patient was a child, born in the hospital, and abandoned by his

mother when one week old. Twelve days later he began to have diarrhœa, the stools contained curds, and the infant lost weight rapidly; during the fifth week a blue papule appeared on the abdomen, and there was a slight discharge from the ear; later, two more papules developed, the body became cyanotic and the limbs slightly rigid. The temperature had ranged from 94° to $100\frac{1}{2}^{\circ}$ F., being apyretic during the last week. Two other cases are referred to that had occurred previously in infants, and in which the symptoms were essentially similar. Dr. W. E. Hammond obtained pure cultures of the bacillus pyocyaneus from all the cases, although in the last bacteria of suppuration were also found in the cultures from the spleen and heart's blood; a pure culture, however, was obtained from one of the purple spots. A rabbit inoculated died in fourteen hours, and presented the characteristic symptoms, and pure cultures of the bacillus pyocyaneus were obtained from its tissues. Cameron sums up the cardinal symptoms of infection with the bacillus pyocyaneus as follows: 1, wasting, marked and rapid; 2, diarrhœa, with symptoms of gastric and enteric catarrh; 3, fever, moderate, ranging from 2° to 3° ; 4, albuminuria, not yet observed in young infants on account of the difficulty of obtaining urine, but always present in rabbits; 5, rash, an eruption of bluish or purplish papules, more or less numerous, two to seven millimetres in diameter, and sometimes becoming pustular; 6, muscular disorder, spastic paralyses, occurring late and affecting only the lower limbs; there seems to be pain upon movement. [In the same journal, Shaw and Anderson report two cases of pyocyanic wound infection, the dressings showed the characteristic bluish-green discoloration only after they had been saturated for a day or more.]

The Duration of Phthisis. (*Semaine Médicale*, March 11, 1896.) By Dr. Hanot, of Paris.

It is not the nature of the lesion as much as it is its location and mode of development that explain its progress; thus, an active lesion is of more significance than a quiescent one. In reckoning the factors that modify the evolution of chronic phthisis, the coefficient of the individual, and the virulence of the bacillus of Koch, which is very variable, must not be forgotten. Maternity, lactation, alcoholism, and syphilis accelerate the rate of the development of a tubercular process, but an old syphilis, of twenty years' standing or more, favors the production of a fibroid phthisis. Hereditary syphilis predisposes strongly to all tubercular processes. In general, purulent pleural effusions do not seem to cause notable acceleration; and in the case of sero-fibrinous pleurisy, the tubercular infection is at a minimum, and the course is very chronic; moreover, tuberculin has been found in the liquid and possibly exerts some immunizing power. Pneumonia, occurring during the incipieny of pulmonary tuberculosis, or in a very chronic case, may have no bad effect, but in advanced or advancing cases it is always serious. A pulmonary tuberculosis, uncomplicated by tuberculosis of other organs, progresses more slowly. Certain drugs may,

in some conditions, accelerate the disease; thus, cod-liver oil, improperly purified, may cause a putrid intoxication of the system; creosote, by causing digestive disturbances, may interfere with assimilation, and drastic purgatives may have most serious effects in ulcerated intestines. Arsenic, acting upon a liver already weakened, may cause icterus and epistaxis and slight hepatic enlargement. The old belief in the antagonism supposed to exist between certain infectious diseases and mitral lesions and tuberculosis has been abandoned. Emphysema also must be regarded as a result and not as a cause of chronic phthisis. Pneumothorax, however, does seem to have a beneficial effect in some cases. Fibroid phthisis is more apt to occur in those suffering from a rheumatic diathesis and in the aged. The effect of scrofula is doubtful, acute phthisis certainly occurring in some cases.

On the Guinea-Worm. (*British Medical Journal*, November 30, 1895.) By Patrick Manson, M.D.

The writer describes a case that came under his observation. The patient had lived in the tropics where the *dracunculus medinensis* is common, and, after his return to England, he noticed a small pustule forming at the ankle, in which the head of the worm was found. This parasite attains a length of from two to four feet, and lives in the connective tissue of the host. Whenever the limb was moistened, a drop of milky fluid appeared in the pustule, which was found to contain embryos of the worm. To accomplish parturition a portion of the uterus is extruded through the mouth and ruptures. This is repeated as often as moisture is applied, until all the embryos are expelled, the period of parturition lasting about two weeks; and until this is complete, it is improper to attempt to wind out the parasite. The immediate host is a fresh-water crustacean, the cyclops quadricornis. According to Manson's experiments, metamorphosis is complete in about seventy days,—Fedschenko says thirty-five days for tropical climates. Preventive treatment is obviously the avoidance of unboiled or unfiltered water. For curative treatment, the injection of weak solutions of bichloride of mercury may be tried.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

The Treatment of Scarlatina by Antistreptococcic Serum. (*Annales de l'Institut Pasteur*, January 25, 1896.) By Alexander Marmorek, M.D.

From October 16 to December 31, 1895, one hundred and three children entered the Hôpital Trousseau with scarlatina. Seven were in the

stage of desquamation, and were not treated with the serum. Of the ninety-six treated a bacteriological examination demonstrated the presence of the streptococcus, either alone or associated with other microbes. In seventeen the bacillus of Löffler was found, and four of this number entered the hospital with signs of diphtheritic intoxication, and died under treatment by the two serums.

Each child received on entering the hospital a dose of ten centigrammes of antistreptococcic serum, which was doubled if the condition was serious. The treatment was restricted to injections of serum and antiseptic washes for the throat. The injections were repeated daily if indicated by rise of temperature, but ordinarily one or two injections sufficed. If swollen glands or albumin in the urine appeared, the injections were begun anew, and continued until a normal state prevailed. The largest amounts given were eighty centigrammes, to an infant with scarlatinal rheumatism, and ninety centigrammes, to a child four years of age with a broncho-pneumonia.

The effects of the serum are to prevent grave complications, and to produce a rapid lessening of faucial membrane, of engorgement, and of a disposition to delirium. Under its influence the general condition is ameliorated, the pulse becomes slower and stronger, the temperature, if due to streptococcic complications, falls, while the fever caused by the scarlatinal virus continues its evolution, and the eruption pursues its ordinary march. This last statement favors the opinion that scarlatina is not caused by the streptococcus. The most favorable action of the antistreptococcic serum has been manifested on the inflamed glands. Nineteen infants on entering the hospital had swollen glands in the neck, which were reduced without exception and without a single case of suppuration.

On the Influence of Lecithine upon the Growth and Multiplication of Organisms. (*Le Progrès médical*, January 11, 1896.) By M. B. Danilewsky, M.D.

The subcutaneous injection of lecithine in dogs considerably increases the number of red blood-corpuscles. This change in the composition of the blood is brought about within a few days after the injection and lasts for some time. Under the influence of lecithine frog tadpoles have grown rapidly. This substance has a direct stimulating influence of great importance upon the processes of multiplication of the cellular elements,—that is, upon the enlargement of the nucleus, and thus upon the changes of multiplication.

The Preventive Treatment against Hydrophobia during 1894 and 1895.—At the Pasteur Institute fifteen hundred and twenty-three persons have been treated for hydrophobia during the past year. These persons have been divided into three classes,—those bitten by an animal which has been experimentally demonstrated as having rabies by the development of the disease in an animal inoculated with its cord, those in which the animal

has been pronounced mad by a veterinary surgeon, and those in which the animal has been suspected of rabies. One hundred and twenty-two persons belonged to the first class, nine hundred and forty-nine to the second, and four hundred and forty-nine to the third. Twelve hundred and sixty-three of the whole number treated were French.

The mortality per cent. has become much reduced during the last decade.

Year.	Persons treated.	Deaths.	Mortality. Per cent.
1886.....	2671	25	0.94
1887.....	1770	14	0.79
1888.....	1622	9	0.55
1889.....	1830	7	0.38
1890.....	1540	5	0.32
1891.....	1559	4	0.25
1892.....	1790	4	0.22
1893.....	1648	6	0.36
1894.....	1387	7	0.50
1895.....	1520	2	0.13

At the bacteriological station in Odessa one thousand persons were treated in the year 1894. Sixteen discontinued treatment. Of the remaining number (nine hundred and eighty-four) forty-two had not been bitten, but had run the risk of infection by handling persons or animals sick with the disease, or by the making of autopsies. The evidence of the disease was found one hundred and thirty-seven times experimentally, two hundred and fifty-one times by autopsy, and five hundred and thirty-six times by the appearance of symptoms. The mortality was 0.21 per cent., one person, whose death occurred on the fifth day after beginning the treatment, not being included. Another person died precisely a year after the conclusion of the treatment.

At the Imperial Institute for Experimental Medicine in St. Petersburg two hundred and twenty-four persons were inoculated by the Pasteur method in 1894. In one hundred and ninety-three cases the wound was made by a dog, in eighteen by a wolf, seven times by a cat, five times by a horse, and once by a hog. Of this number one hundred and fifteen were bitten on the upper extremities, and fifteen on the head and neck. Three of the whole number died, two being taken with the disease during treatment.

The New York Pasteur Institute gives the following statistics for 1895: The total number treated was one hundred and sixty-seven. Of this number fifty-seven were bitten by animals in which rabies had been evidenced by experimentation, or by the death of a person or an animal bitten by them, twelve persons were wounded by animals pronounced rabid by a veterinary surgeon, and ninety-eight were bitten by animals suspected of the disease. Two persons who began treatment several days after being bitten died.

Argonin. (*Berliner klinische Wochenschrift*, No. 7, 1896.) By Arthur Lewin, M.D.

Dr. Arthur Lewin reports his experience with argonin in the treatment of twelve cases of gonorrhœa, following the method which is recommended by Jadassohn. A solution in the concentration of one and a half parts of argonin to one hundred of water was employed. Of this ten cubic centimetres were injected five times a day, the fluid being retained in the urethra after each injection for five minutes. In nine cases out of the twelve the gonococci disappeared within two to six days after the beginning of the treatment, and subsequent bacteriological researches did not reveal the presence of the organism again. Of these one case was treated for four weeks by other methods with no success, while the argonin solution in two days killed the gonococci. Of the other three cases, one patient was lost sight of a short time after commencement of the treatment; another case showed the presence of the gonococci after the argonin treatment had been used for a period of ten days; and in the third case the gonococci always reappeared when the treatment was stopped. After the removal and destruction of the gonococci, in the successfully treated cases, a slight catarrhal discharge remained, which yielded in a short time to the application of sulpho-carbolate of zinc, or any other astringent. Dr. Lewin agrees with Jadassohn that argonin is destructive to the gonococci, and believes that it has the advantage over all other antiseptics in not causing any irritation in the urethra. It can, therefore, be applied in the earliest stages of the disease. The cases on record are yet too few in number to allow a reliable statement to be made in regard to the beneficial effect or otherwise of argonin in chronic gonorrhœa.

Chinese Opium. (*Pharmaceutical Journal*, December 14, 1895.) By Frank Browne, M.D., F.C.S.

In the Chinese provinces of Kwei-chou, Yunnan, and Sze-Chuen large quantities of opium are grown for native consumption, and this opium is rapidly displacing the high-priced imported drug.

A minute examination of these three varieties of opium has been made, not only with regard to the amount of morphine they contain, but also of the other alkaloids possessing physiological activity, and whether free from adulteration. The alkaloids were separated by Pflügge's process, certain modifications having been made so as to separate them in a state of purity, and each alkaloid isolated was subjected to its distinctive tests.

A chart is given which shows the amount of each alkaloid in one hundred parts of dried opium. The Yunnan opium contains twice as much morphine as that from Kwei-chou, and the Sze-Chuen three times as much; but the Kwei-chou opium has three times as much narcotine as each of the others. The other alkaloids varied but little in the different specimens. On smoking the value of the Kwei-chou was found to be best and strongest; the Yunnan was second in quality; the Sze-Chuen was inferior to the others, although it contained much more morphine.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D., AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the
University of Pennsylvania,

Medical Superintendent of the Presbyterian
Hospital.

A Study of the Weak Foot. (*New York Medical Journal*, November 9 and 16, 1895.) By Royal Whitman, M.D.

The function of the foot is to bear the weight of the body and to serve as a lever for its work. Normally this weight and strain fall through the centre of the foot and are balanced there by muscular activity. If for any cause the foot ceases to act or to be used as a lever, it loses the support and control of the muscles which have balanced the weight in its proper relation to it, and the attitude of passive support must be assumed, in which the burden falls on the inner side and the strain upon the ligaments. This is the weaker side, for the os calcis, hollowed out on its inner side for the passage of vessels and tendons, occupies a position of unstable equilibrium, and the weight of the body tends to tip it over into the flat-foot position of valgus. If the weight is thrown to the outer side of the foot and the great toe pressed firmly against the floor, much more strain can be borne without a semblance of deformity.

Flat-foot is the further development of the weak foot. It is practically a dislocation in which the astragalus has slipped downward and inward, causing a bulging on the inner side. The leg resting on the dislocated astragalus turns in; the foot turns out and is abducted or everted in its relation to the leg; the arched portion of the foot is broadened and flattened. This deformity is progressive, and is accompanied by spasm, secondary contraction, atrophy of muscles, and by accommodative changes in the bones and ligaments.

The safeguards of the foot are muscular activity, perfect freedom of painless motion, and normal alternations of attitude. Common causes of the limitation of its activity, its leverage, and its balance are very evident. Cramping the toes in tight shoes and perching the foot on an insecure heel are certainly not conducive to the well-being of the foot. The special muscles of the great and little toes are often atrophied by disuse, and the incidental corns and bunions make active motion of the foot painful. The joints of the foot may be weakened by the local effects of gout and rheumatism or by injuries; the foot may be overworked in occupations that require long standing; and in childhood weakness due to rachitis or other forms of defective assimilation may prevent the proper use of the foot.

The earliest symptoms of weak foot are feelings of discomfort, of tire, and of strain about the inner side of the foot and ankle, a dull ache in the calf of the leg after long standing, or a sharp pain radiating from the point

of weakness after over-exertion. The range of motion gradually becomes more and more restricted and the pain and discomfort more general in character.

In all cases of weak foot a thorough examination of the functional ability and use should be made. The manner of walking and standing should be noted, particular attention being paid to the line of strain or leverage. A line drawn down the crest of the tibia from the centre of the patella, continued over the foot, should meet the interval between the second and third toes. The contour of the foot should also be examined; its internal border should curve slightly outward so that if the feet are placed side by side with the heels and toes in apposition a slight interval remains between them. The limitation of range of motion should next be tested. For testing dorsal and plantar flexion the leg must be fully extended at the knee, the line of strain must be in its normal relation so that the foot may be neither adducted nor abducted and the observations made on its outer border. The patient should be able to flex the foot well beyond a right angle, from ten to twenty degrees. Voluntary extension can be made to about 130 to 140 degrees. The power of adduction is the most important test, however. With the leg extended and the patella pointing forward, the foot is turned in as far as possible. The actual adduction is about thirty degrees. In many instances this motion is completely lost, the entire leg being turned in the effort to adduct the foot.

The principles of the treatment of the weak foot or flat foot are very simple. The first step is to make passive motion free and painless to the normal limit, for while motion is restrained by deformity or pain or by adhesions or contractions, increase of muscular strength is impossible. In practically all cases it will be necessary to provide a proper shoe, containing sufficient space for the movement of the toes and a sole that corresponds to the outline of the normal foot. A simple expedient is to raise the sole and heel of the shoe slightly on the inner side to simulate the wearing away on the outer side, as in the use of the normal foot. This aids in overcoming the valgus and is especially useful in the treatment for the weak foot of children.

Voluntary exercise, raising the body on the toes, first on both feet, finally on one foot, for from twenty to one hundred times, is in many instances all the treatment necessary. A brace may be needed to hold the joints in proper position, which, to be efficient, must hold the foot laterally as well as support the arch. A plaster cast of the foot is made and the brace, cut of the best steel, is moulded upon it, and tempered so that it may not yield to the weight of the body. This brace clasps the weak part of the foot and holds it together; the broad internal upright portion covers and protects the astragalo-scapoid junction; the external arm covers the calcaneo-cuboid junction and the outer aspect of the foot; the lower portion forms a comfortable support for the sole, reaching from the centre of the heel to just behind the ball of the great toe.

In a limited number of cases it is necessary to divide the tendo Achillis and to fix the foot in a position of extreme equino-varus with plaster-of-Paris bandages.

A Contribution to the Study of Mycetoma of the Foot as it Occurs in America. (*Journal of Cutaneous and Genito-Urinary Diseases*, January, 1896.) By James Nevins Hyde, A.M., M.D., Nicholas Senn, M.D., Ph.D., LL.D., and D. D. Bishop, M.D., of Chicago.

The clinical appearances were characteristic and involved the anterior two-thirds of the left foot. This area was converted into a shapeless mass, the tumefaction involving the toes and the dorsal and plantar tissues. The deformity was most marked over the dorsal surface. The mass of morbid tissue represented a bulk considerably larger than that of the normal foot, and terminated abruptly and by a well-defined line near the articulations of the metatarsal bones with the tarsus. The tumefied mass had a boggy consistence when handled, and its surface was very irregularly beset with tubercles, or, better, fungoid projections from the irregular surface of the infiltrated skin. Each individual papilliform mass was tunnelled by one, occasionally by several, fistulous canals, which passed to a softish tissue beneath, the probe not encountering osseous structure. The greater number of these warty projections varied from the size of a small pea to that of a large bean, and were elevated at a corresponding height above the general level. They were massed at the proximal rather than at the distal portion of the foot; but were yet irregularly scattered over all its involved surface. A puriform excretion could be expressed from the orifices of some; but none furnished an exudate which might be compared with fish-roe or which had any suggestion of blackness in its color. The central canal perforating the axis of each tubercle or papilloma often seemed blocked by fatty granulations springing from the walls of the excavation. These masses were, however, much softer than the nodules of hypertrophic lupus, and readily admitted an exploring instrument to the fundus of the fistulous excavation. The general color of the diseased portion of the foot was rather grayish than of an inflammatory hue. A piece of the morbid tissue, having been excised, was submitted to examination. Two guinea-pigs were also inoculated with material taken from a discharging sinus, the result being that one died in the course of four days, the autopsy revealing nothing as to the cause of death. As it has since been discovered that the effective fungus of the disease is deeply buried beneath granulation-tissue, we think no inferences can be drawn from these facts. The leg was amputated at the lower third. The pathological report is full and conclusive. Section through the nodules and underlying part brings to view a spongy, reticulated, fairly well circumscribed tissue, at times having a rather dense fibrous wall. These collections of spongy tissue are easily traceable down to the periosteum of the underlying bone. The periosteum is very much thickened, but at certain points presents a reticulated appearance, identical with that

observed in the softer tissues. Longitudinal section of the first metatarsal bone brings to view two small rounded areas, one the size of a pea, the other slightly larger, both filled with a whitish granulation-like tissue. These collections are surrounded by a firm fibrous capsule, which is easily separated, leaving a smooth-walled cavity in the bone. They are situated just beneath the periosteum, and communicate with the reticulated mesh-work in the latter. The rest of the osseous structure appears more spongy than normal. On pressure over the soft tissues, numerous whitish, small, pin-head-sized bodies escape from the meshes of the reticulum; and scraping of the whitish collections in the bone removes similar bodies. Microscopically, one of the smaller nodules with no demonstrable external opening was cut and examined. The general appearance is that of rather active inflammation. The intercellular spaces in the epidermis are considerably enlarged. Here and there are widely-open spaces in which the rete-cells are drawn out into long strings. Granular deposits in these spaces are often seen, suggesting the presence of a serous exudate. Leucocytic infiltration between the epidermal cells has also taken place. In the derma, and more deeply situated, are bodies having a ray-like appearance; these were found in all the nodules examined, and consist of more or less rounded masses, often having a scalloped border. They occur singly and in groups. In all these there is a central area which stains faintly with hæmatoxylin, surrounding this a zone, which also stains deeply with the same dye; and outside of all a narrow margin staining with eosin only. These three divisions of the fungus may be called, as suggested by Kauthack, the central area, the marginal zone, and the radial zone. The central zone, under high power, appears granular, but shows a few filamentous threads resembling long, slender bacilli, having an obscure radial arrangement. In the marginal zone numerous long, deeply-staining threads, having a distinctly radial arrangement, are seen. These are very slender and stain best at the periphery, giving the appearance of a fine mycelial net-work. The radial zone is separated from the marginal zone by a narrow space, which stains scarcely at all, and which appears in the main to be granular. A few delicate threads may be traced through this light area, connecting the marginal and radial zones. In the radial zone one can make out distinctly radiating lines, giving an appearance of more or less wedge-shaped bodies closely packed together, with their broad ends presenting peripherally. The surrounding tissues show numerous newly-formed blood-vessels, other better formed blood-vessels distended with corpuscles, and in many a well-marked proliferation of endothelia has occurred. Leucocytes, epithelioid cells, and giant-cells are seen. Granular material staining with eosin is often present in the connective-tissue spaces.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

WILLIAM BROADDUS PRITCHARD, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

AND WM. G. SPILLER, M.D.,
Philadelphia.

Paralysis from Injury of the Lower Part of the Medulla Oblongata. (*Deutsche Zeit. f. Nerv.*, vol. viii., Nos. 1 and 2.) By Professor Wl. v. Bechterew, St. Petersburg.

A gunshot wound in the cervical region caused the following symptoms:

1. On the entire left side of the body, with the exception of the face, temporary paresis, anæsthesia for pain and temperature, and considerable impairment of the sense of touch and pressure, with preserved muscular sense.

2. On the entire right side of the body, with the exception of the face, at first complete paralysis, and later paresis, great impairment of sensibility to touch and pressure, and loss of muscular sense.

3. Anæsthesia for all forms of sensation on the right side of the face, especially in the distribution of the upper two branches of the fifth nerve.

4. Notable impairment of the special senses—sight, hearing, taste, and smell—on the anæsthetic side of the face.

Tactile hypæsthesia on both sides of the body, crossed paralysis of sensibility to pain—*i.e.*, in the extremities on one side, the face on the other,—loss of muscular sense on the side opposite to that of the analgesia, muscular atrophy and change of electrical reactions, temporary difficulty in swallowing, persistent singultus, paresis of the bladder, ankle-clonus on the more paralyzed side (right), forbade a diagnosis of traumatic neurosis. It was probable that only one shot had penetrated the vertebral column, and that this was at the extreme upper part.

Experiments on dogs by Holzinger in V. Bechterew's laboratory showed that destruction of the entire spinal gray matter, together with the posterior columns, did not abolish the sensibility to pain, whereas section of the lateral columns alone was always accompanied by analgesia of the body below the section. He concludes that the fibres for pain ascend in front of the crossed pyramidal tracts in the lateral columns, after having decussated in the anterior commissure; higher up they assume a position near the descending root of the fifth nerve, and then form part of the interolivary layer of the fillet. The motor paralysis of both right extremities, which later improved, with preservation of the senses of pain and of temperature, the temporary paresis of the left side of the body with complete loss of these forms of sensation, and the right-sided anæsthesia of the face indicated a lesion low in the medulla oblongata, involving the right pyramid before decussation, the right crossed pyramidal tract, and the descending root of the right fifth nerve. The latter lies close to the crossed pyramidal tract, and this was the

area probably most involved, whereas the pyramid is more in front. Motor fibres also descend in front of the crossed pyramidal tracts in the lateral columns and innervate the same as well as the opposite side.

The temporary vesical paresis, the difficulty in swallowing, and persistent singultus indicated involvement of the central fibres for the bladder, the region of the vagus, and the central fibres for the phrenic nerves.

The change in the special senses on the anæsthetic side of the face has been shown by V. Bechterew to be due to general facial anæsthesia, and not to alteration in the nerves of special sense.

A wound purposely produced in a dog at the lower part of the medulla oblongata caused symptoms closely allied to these described.

It is probable that the fibres of tactile sensation do not all cross in the cord, and that those from the legs decussate more freely than those from the arms.

The patient was much more unsteady in standing on the right foot alone, where muscular sense was lost and tactile sense diminished, than in standing on the anæsthetic left foot.

The absolute failure of ataxia on movement when sensation was so seriously affected is contrary to the theory that ataxia is dependent on sensory changes. The tendon reflexes were lost on the anæsthetic side.

Tumor of the Spinal Cord with Unusual Clinical Phenomena. (Wiener medicinische Klub, published in *Wiener medicinische Wochenschrift*, No. 6, 1896.) By H. Schlesinger, M.D.

Some time after traumatism paralysis of the right upper and paresis of the right lower extremity developed, with great atrophy of the muscles of the right shoulder, which made movement at this part impossible. The head could only be slightly bent. The great atrophy of the shoulder contrasted notably with the excellent development of the musculature of the forearm and hand. The reflexes were slightly increased in the upper extremities and were abnormally vigorous in the lower. On the entire body tactile sense was normal, sensibility to pain was somewhat increased, but over the shoulder musculature and the right deltoid thermal sense was notably decreased. Except a slight ataxia of the right upper extremity there was no disturbance of the muscular sense. Later the muscles of the left shoulder became atrophied, and severe pain developed, radiating into the right hand and posterior part of the head, especially on the right side.

There were no vesical nor rectal disturbances. Later in the disease the patient had convulsive attacks, lasting five to ten seconds and involving the entire body, accompanied by opisthotonos and trismus, and without loss of consciousness.

The radiating pains, the hyperalgesia, and the rapid course were contrary to a diagnosis of syringomyelia.

The paralysis and atrophy indicated involvement of the second to the fifth cervical roots.

On account of the great prominence of the sensory symptoms and of the probability of a lesion of a transverse nature, the diagnosis of tumor of the cord was made, and because of its rapid development it was supposed to be a gliosarcoma.

The autopsy showed a tumor of the cervical cord, which extended downward from the motor decussation, and involved the right side especially. The freedom of the small hand muscles from atrophy was contrary to the usual condition in tumors of the cord.

It is desirable to know exactly how much of the posterior columns was destroyed in this very interesting case, as vesical and rectal fibres and those of tactile and muscular sense are supposed by some authors to be located here, and in this case these functions were not notably affected.

Recent Investigations concerning the Fillet. (*Wiener klin. Wochensch.*, January 30, 1896, No. 5, Verein f. Psych. u. Nerv. in Wien.) By H. Schlesinger, M.D.

The fillet is the chief sensory tract in the medulla oblongata and the cerebral axis. A number of systems are united in this, and of these Schlesinger has studied in five cases of ascending degeneration, caused by cavity-formation, and in one of descending degeneration of the fillet, those fibres which join the median fillet within the pons. In one case of ascending degeneration the median fillet of one side was totally degenerated. He reports the following facts:

1. At the level of the fifth sensory nucleus fibres appear which rapidly increase in number, and mingle with the middle third of the main fillet; these fibres Schlesinger calls the "lateral pontine bundle of the fillet." Higher up this large band of fibres assumes a more lateral position, and at the cerebral end of the pons joins the fibres of the crusta and leaves the fillet entirely. Probably the central fibres of the fifth nerve are contained in this tract.

2. In the lower third of the pons sound fibres appear close to the raphe in the degenerated area, which become more numerous and form the crusta-fillet (*Fussschleife*). Higher these leave the fillet and join the median side of the crusta.

In the case of total degeneration of the bulbar portion of the fillet the crusta-fillet on the side of the lesion, which involved the sensory fibres before the decussation, was considerably degenerated in about one-fourth of its extent. This fact was confirmed by his other cases. He concludes from this that fibres of the crusta-fillet ascend from the medulla oblongata without decussating, and join higher up the portion arising in the pons.

Extraction of Teeth in Connection with Paralysis of the Seventh Nerve. (*Wiener klin. Wochensch.*, No. 5, January 30, 1896, Verein f. Psych. u. Nerv. in Wien.) By Frankl-Hochwart, M.D.

Two cases of paralysis of the facial nerve following tooth-extraction

have been reported by Philipp. Hatschek has reported three such cases taken from the clinical material of Frankl-Hochwart. Frankl-Hochwart has observed six cases of uncomplicated facial nerve-paralysis following extraction of teeth, when no other etiology could be obtained. In three cases possibly a predisposition existed, as one patient suffered from migraine, another was hereditarily afflicted, and a third had already had facial paralysis. Frankl-Hochwart believes the cause in such cases is an infectious neuritis, and that owing to the extraction the micro-organisms have an opportunity to develop. A seventh case, in which facial paralysis occurred after breaking of a carious tooth at the root, is in favor of this view.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

LEGAL LIABILITY OF A MEDICAL AND SURGICAL INSTITUTE FOR THE FALSE REPRESENTATIONS OF ITS PRESIDENT AND PHYSICIAN-IN-CHARGE AS TO THE CURE OF A PATIENT.

THE representations made to a patient by the president and physician and surgeon in charge of a medical and surgical institute as to his ability to cure him, and on the strength of which representations, that at the institute they could and would cure him, he was induced to pay the sum of five hundred dollars for such medical and surgical treatment for the injuries from which he was suffering, when L., the president, did know, or should have known, from his experience as a physician and surgeon, that the injuries of H., the patient, were incurable, may be made the basis of an action for deceit.

In this case¹ there was a verdict for the plaintiff for five hundred dollars and interest, and the Supreme Court dismissed the appeal of the defendants and affirmed the order of the lower court denying them a new trial.

The Supreme Court, in spite of the zeal and apparent sincerity with which they were urged by counsel for the defendants, passed over their thirty-seven assignments of error, relating principally to the admission of evidence, as not requiring special reference, and based its opinion upon what was the real question in the case: the sufficiency of the evidence to support the verdict; and this, in turn, depending mainly on an inquiry as to whether

¹ Hedin vs. M.— Medical and Surgical Institute, 64 N. W. R. 158.

the statements and representations alleged to have been made, and said to have been relied on, were actionable.

The facts of the case, as they appeared in evidence at the trial, were that H., the plaintiff, an illiterate man, badly injured in an accident, and physically a wreck, consulted with the physician and surgeon in charge of a medical and surgical institute or hospital as to his condition and the probability of a recovery. After an examination by the surgeons, he was positively assured, if he told the truth as to what was said (and the jury found that he did), that he could be cured, and by treatment at that institute could and would be made sound and well.

In behalf of the defendants, it was contended that, at most, these statements were but expressions of opinion as to matters contingent and uncertain in their very nature, not susceptible of certain determination or of actual ascertainment, and that therefore no action as for deceit could be maintained upon them. The Supreme Court, in enunciating the rule of law applicable in such case, said, "To sustain such an action, it must be shown that a false representation of a material fact has been made, in ignorance relied upon, and that damage has ensued. The representation must be fraudulently made, an intention to deceive being a necessary element or ingredient. But positive proof that a party knew his representation to be untrue is not essential. The intention may be proved by showing that, having no knowledge of the truth or falsity of his statements, he did not believe them to be true, of his own knowledge. When the knowingly false assertion is as to the belief of a party, or is as to his knowledge of the fact he assumes to announce, intent to deceive is the inevitable inference. If this defendant, L., made statements and representations to the plaintiff that his injuries were curable, and that with treatment he could become a well and sound man, having no knowledge of the truth or falsity of his statements, and not believing them to be true, or if he made such statements, having no knowledge of their truth or falsity, yet representing that they were true, the intent to deceive is as well established as if positive knowledge of their untruthfulness had been proven. Generally speaking, the representations must be as to a material fact, susceptible of knowledge; and if they appear to be mere matters of opinion or conjecture, they are not actionable. There are many cases, however, in which even a false assertion of an opinion will amount to a fraud, the reason being that, under the circumstances, the other party has a right to rely upon what is stated or represented. Thus, the liability may arise where one has or assumes to have knowledge upon a subject of which the other is ignorant, and knowingly makes false statements, on which the other relies. Where parties possess special learning or knowledge on the subject with respect to which their opinions are given, such opinions are capable of approximating to the truth. And for a false statement of them, when deception is designed and injury has followed from reliance on the opinions, an action will lie.

"Considering the circumstances and the relations of the parties, there

was something more in defendants' statements than the mere expression of his opinion upon a matter of conjecture and uncertainty. It amounted to a representation that plaintiff's physical condition was such as to insure a complete recovery. The doctor, especially trained in the art of healing, having superior learning and knowledge, assured plaintiff that he could be restored to health. That the plaintiff believed him is easily imagined; for a much stronger and more learned man would have readily believed the same thing. The doctor, with his skill and ability, should be able to approximate to the truth when giving his opinion as to what can be done with injuries of one year's standing, and he should always be able to speak with certainty before he undertakes to assert positively that a cure can be effected. If he cannot speak with certainty, let him express a doubt. If he speaks without any knowledge of the truth or falsity of a statement that he can cure, and does not believe the statement true, or if he has no knowledge of the truth or falsity of such a statement, but represents it as true, of his own knowledge, it is to be inferred that he intended to deceive. The deception being designed in either case, and injury having followed from reliance upon the statements, an action of deceit will lie.

"The evidence in this case," continues the Supreme Court, "was sufficient to warrant the jury in finding that plaintiff had sustained a fracture at the base of the skull, and that his injuries were incurable; that, after examination, defendant L. stated and represented that the plaintiff could be restored to health by treatment; and that he made such statements and representations for the purpose of inducing plaintiff to pay over the sum of five hundred dollars to himself, or to the institute, or both. There was evidence from which the jury could find that he made these statements and representations without knowing whether they were false or true, not believing they were true, and also that he made them without knowing their truth or falsity, but representing them to be true of his own knowledge. There was also evidence from which the jury could have found that the physicians and surgeons who made the examination at the institute (L. and another) knew that the plaintiff had sustained a basal fracture of the skull, and that he could not recover his health. The evidence was abundant in support of the verdict."

Counsel for the defendants contended that as to L. the action should be dismissed, because he, as the president of the defendant institute, was simply acting for it as its agent. In answer to this point the Supreme Court said, "We are not aware of any rule of law which will excuse and absolve a person from the consequences of his own wrong because he happened to be the agent of another at the time of the perpetration of the wrong."

It was also urged that the action could not be maintained because of the written contract between the parties. "There is nothing in this," says the Supreme Court; "for the action is not upon the contract, nor is it controlled by its terms and conditions. It is an action for fraud and deceit practised upon the plaintiff, through and by means of which the contract was obtained."

BOOK REVIEWS.

AN AMERICAN TEXT-BOOK OF OBSTETRICS, FOR PRACTITIONERS AND STUDENTS.

By James C. Cameron, M.D., Edward P. Davis, M.D., Robert L. Dickinson, M.D., Charles Warrington Earle, M.D., James H. Etheridge, M.D., Henry J. Garrigues, M.D., Barton Cooke Hirst, M.D., Charles Jewett, M.D., Howard A. Kelly, M.D., Richard C. Norris, M.D., Chauncey D. Palmer, M.D., Theophilus Parvin, M.D., George A. Piersol, M.D., Edward Reynolds, M.D., Henry Schwarz, M.D. Richard C. Norris, M.D., Editor; Robert L. Dickinson, M.D., Art Editor. With nearly 900 colored and half-tone illustrations. Philadelphia: W. B. Saunders, 1895.

This book makes a good impression, which is deepened by further examination. In type, paper, and general appearance there is nothing left to be desired, while the success which has attended the vigorous effort to make the illustrations of surpassing merit has been remarkable. The publisher deserves praise for a liberality which has made it possible to present such a copious array of original plates and cuts of the highest character, and has also permitted the redrawing of all borrowed material so as to carry out one of the most valuable features of the work,—*i.e.*, the drawing to scale. In sagittal sections the same half is always shown for purposes of comparison.

The opening chapter is on the anatomy of the organs of generation, by Dr. Piersol. The subject is by no means easy if one may judge by the obscurity with which writers usually surround it. Here, however, the student, the advanced obstetrician, and the operating surgeon may come for available information and not be disappointed. The author has presented his subject-matter in a way that is both readable and practical. One of the most difficult subjects in the science of medicine is the physiology of pregnancy, and here again Dr. Piersol has done excellent service in presenting the facts so far obtainable in a way which the ordinary human mind can grasp. Too high praise cannot be given to the splendid illustration of both these sections. One of the most comprehensive sections of the work is that on the pathology of pregnancy, by various writers. It is enriched by copious references. Indeed, such references add greatly to the value of the work as a whole. The treatment of excessive vomiting in pregnancy is typical of the rational way in which obstetrical complications are met by the modern physician, who searches for the cause, often a mechanical one, and then directly seeks the removal of that cause. It may disappoint the reader with little experience to learn that "drugs are of use in this complication only in so far as they assist in preserving the patient's strength." In the conduct of normal labor, the safer course is undoubtedly the restriction of internal examination, consequently great attention is here paid to the subject of diagnosis by external palpation. The preliminary douche is to be restricted to cases where the secretions are pathological. These are usually alkaline or feebly acid, as pointed out by Döderlein. The catheter must only be used when sterile and under full exposure. Frequent reference is made to the use of the curette, not only after abortion but in various conditions following labor at term.

There is real need of such wholesome words as those which relate to the mortality in private obstetrical practice. The statement is made emphatically that in private practice in New York, one death occurs in every eighty-nine to one hundred

labors, while in the best lying-in establishments the mortality is not half as great. Attention is called to the fact that in the country districts more physicians still oppose antiseptic midwifery than in the cities, and that in all private practice looser methods prevail than are tolerated in institutions. It is not unlikely that many physicians who boast of the immunity of their patients from septicæmia are self-deceived. It is not unusual to hear of deaths from "pneumonia," "la grippe," and the like, within the puerperal period in the practice of such men, the probable septic origin being ignored. The general disorders, acute infectious accidents, and surgical operations during pregnancy are here fully presented. The problems connected with extra-uterine pregnancy have been rapidly solved in recent years, and the writer on this subject is able to speak with a confidence which would until recently have been impossible. He presents the subject in a very satisfactory way. A somewhat curious relaxation of this writer's usually good technique in asepsis is made when he suggests for a transfusion apparatus the ordinary aspirator. If the tubes have ever been used, as is most likely, for cyst fluids or pus, their cleanliness must always be doubtful and their use dangerous in transfusion. A better vessel than the radial artery recommended can readily be found. The radial nerve is near. Accidental infection is disastrous about wrist tendons. Intravenous injection is elsewhere described as usually done (p. 609).

It is seldom that a reviewer complains of too many illustrations. Diagnosis by external palpation is twice figured in full (pp. 352, 409). External measurement of the conjugate is twice shown, the beautiful plate on page 359 differing from the cut on page 502 in that the head and shoulders of the patient are seen. There is no necessity for fully illustrating podalic version in two places. As with pelvimetry, the subject should be discussed fully in one place only, both to avoid confusion in reference and for the sake of thoroughness. The importance of pelvimetry would be better appreciated by the profession were the frequency of pelvic deformity understood. These abnormal conditions of the bony pelvis are richly illustrated, while the treatment of each complication is separately considered. The manual method of rapid dilatation of the cervix in placenta prævia, as advocated by P. Harris, is mentioned, his results being highly successful. Authorities who advocate the tampon are, perhaps, too prominently quoted, considering the serious results which follow this procedure as commonly applied. The place of the tampon in postpartum hemorrhage is brought out. The significant comment is made that "certainly the cases are very rare in which this treatment will be required."

The full attention to the matter of breast massage in the prevention of mastitis and breast abscess is very commendable.

More attention might wisely be given to the physiology of the new-born than can be included in seven pages. This subject, falling between the obstetrical works proper and those on diseases of older children, is properly treated by neither.

The intraperitoneal treatment of the stump after removal of the pregnant uterus is not considered ideal in result though theoretically preferable.

Cœliotomy for sepsis in the puerperal period is one of the live subjects of the day. Especially is the field for hysterectomy under discussion. The material here presented is based upon the writer's personal experience, and contains several more or less valuable case reports. He frankly admits having erred several times in performing operations which could do no good. Abdominal section is contra-indicated or is not required in simple sapræmia; in septic endometritis of all forms,—diphtheritic, ulcerative, suppurative; in dissecting metritis, sloughing intra-uterine myomata, or in suppurative metritis with the abscess pointing into the uterine cavity; in phlebitis, lymphangitis, and in direct infection of the blood-current. The writer's rule is not to open the abdomen for puerperal sepsis unless there are physical signs present in the abdomen or pelvis. The interest and value of the work are much increased by the giving of the names of the writers of sections or parts of sections. The advantage

of doing this obscurely in the table of contents only is not apparent. The index is copious and satisfactory. The publisher has burdened the reader with less than thirty pages of advertisements of other publications. On the whole, the book is a most acceptable addition to the working library of the physician. G. E. S.

AN INTRODUCTION TO PATHOLOGY AND MORBID ANATOMY. By T. Henry Green, M.D., F.R.C.P., Physician and Special Lecturer on Clinical Medicine at Charing Cross Hospital, and Physician to the Hospital for Consumption and Diseases of the Chest, Brompton. Seventh American from the Eighth English Edition. Revised and Enlarged by H. Montague Murray, M.D., F.R.C.P., Physician to Out-Patients, and Lecturer on Pathology and Morbid Anatomy at Charing Cross Hospital. Illustrated by two hundred and twenty-four engravings. 8vo, pp. 598. Philadelphia: Lea Brothers & Co., 1895.

The fact that a text-book has passed through eight English and seven American editions should lead the reader to expect to find a work of intrinsic value, and one from which information of worth might be gained. In this expectation the reviewer is not disappointed. The book is distinctly modern, and in these times of rapidly-changing views on pathological matters this reputation is fairly difficult to acquire. In passing judgment on the character of a work, from the modern stand-point, one naturally turns to the section on bacteriology. Here we find nearly one hundred pages devoted to this branch, of such vast import to the pathological and clinical diagnosis of to-day, including a discussion of the relation of organisms to fermentation processes and to infective diseases, and a review of the principal theories to account for the occurrence of these bodies.

In the section on the blood, the treatment of the varieties of leucocytes and their granules, observed in leucocytosis, is meagre, and the significance of the occurrence of leucocytosis, in various conditions, is not fully stated.

The chapter on the carcinomata is good, and the parasitic theory is discussed under the heading of the etiology of tumors. The editor states that "there is but little positive evidence in its favor," and concludes that the whole question leaves "only more or less probable surmises before us." "The view that the physiological resistance of the connective-tissue is reduced until epithelium, having, perhaps, only its normal tendency to grow, can invade it, appears to accord best with known facts; unusually rapid multiplication of epithelium would then naturally result from increased food-supply." "As to the etiology of the sarcomata," he says, "there is even less ground for surmise." It seems to the reviewer as though the parasitic theory has much in its favor, however, and waits the arrival of a suitable culture medium to be proved. With regard to the simple tumors, the editor believes Cohnheim's theory of "embryonic remains" the most likely.

It is a matter of regret, the reviewer believes, that formulæ for stains, hardening fluids, fixing solutions, and the like, are omitted. J. M. S.

ANOMALIES OF REFRACTION OF THE MUSCLES OF THE EYE. By Flavel B. Tiffany, M.D., Professor of Ophthalmology and Otology of the University Medical College of Kansas City, Mo.; Oculist and Aurist to All Saints' and German Hospitals, etc. Author's Second Edition, 1896. 8vo, pp. viii, 307. Kansas City, Mo.: Hudson Kimberly Pub. Co.

That a second edition of this popular work should be demanded in eighteen months' time must be gratifying to both its well-known author and his publishers. Comparison with the first edition, with which the reviewer is fully conversant, shows a most careful revision both as to text and illustrations, so as to bring the subject fully abreast with the times.

The work bears the impress of the results of a long-continued and successful

practical teaching from one whose dictum in such matters is both certain and far-reaching.

It is well worthy of perusal not only by the student who is desirous to gain a proper ground-work of knowledge upon which to place his future studies, but by the advanced clinical ophthalmologist who wishes to keep fresh the best truths and axioms that have been given to him in ophthalmology.

We predict a ready sale and a quick exhaustion of the present edition.

MODERN MATERIA MEDICA, WITH THERAPEUTIC NOTES, FOR THE USE OF PRACTITIONERS AND STUDENTS OF MEDICINE. By Dr. Otto Roth. Seventh Edition. Revised by Dr. Gregor Schmitt, Director of the Royal National and Provincial Boards of Health in Würzburg. New York: William Wood & Co., 1895. 8vo, pp. 467.

The greater portion of this work consists of brief notes on the Therapeutic Action of Drugs, and numerous prescriptions illustrating their special uses. Lists are given of the drugs most commonly used for subcutaneous injection and for inhalation, and these are followed by a chapter entitled Therapeutic Notes, in which a short account is given of the treatment suitable for the various diseases which are grouped under the usual divisions.

The prescriptions represent German rather than American pharmacy, and the instructions under the head of Therapeutics are interesting as illustrative of German therapy of to-day.

The volume will doubtless be of some value to young practitioners, assisting them in making practical use of their theoretical knowledge. A. D. B.

PRESBYTERIAN EYE, EAR, AND THROAT CHARITY HOSPITAL REPORTS, Baltimore, Maryland, U.S.A., Vol. I., No. 1, January, 1896. 8vo, pp. 42.

American ophthalmology is to be congratulated in the fact that this large hospital is the fourth to fall in line in giving some of the results of the work of its well-known surgical staff that has been accomplished within its walls.

The report, which appears quarterly, embraces in this, the first part, some very interesting articles upon eye affections by Julian J. Chisolm and Woods, and contains several valuable reports upon ear and throat work by Herbert Harlan, Winslow, and Hartwig. A classification of the hospital work for the nine months ending September 30, 1895, completes the volume.

We sincerely hope that the good work may continue.

C. A. O.

ITEMS OF INTEREST.

THE publication by Weigert of his method of staining the neuroglia has been awaited for several years by pathologists and neurologists with the most intense interest. Now that the paper is at hand, the exceptional value of this new method has not been over-rated. We presented last month to our readers in the department of pathology an abstract of the most important parts of the work, prepared by Professor von Kahlden, of Freiburg, for the *Centralblatt für Allgemeine Pathologie*, and translated by Dr. W. G. Spiller,

Weigert's Neuro-
glia Stain.

Associate in Clinical Medicine in the Pepper Laboratory. A study of the paper will cause us to modify considerably our views of certain changes which take place pathologically in the nervous system, and will throw new light upon many problems of a neurological character.

The wide-spread interest and great clinical importance attached to the discovery of Röntgen have led us to undertake the preparation of a symposium upon this subject. Skiagraphy will, therefore, be treated at length in the June number of the *INTERNATIONAL MEDICAL MAGAZINE*. Original communications are expected from a number of investigators, and the articles will be illustrated in the best known manner. Besides these papers, literature on the subject will be given up to date, and abstracts of many of the important articles will also be prepared.

Röntgen's Dis-
covery.

A small-pox hospital at Oakridge, near Stroud, Great Britain, to the establishment of which there had been great opposition in the neighborhood, was recently surrounded by a mob of some hundreds of persons, and in the presence of several constables, who were quite helpless, set on fire in various places and burnt to the ground. A party of police from Gloucester appeared on the scene next morning, and most of the ringleaders were arrested, and, after being remanded at the local police-court, were conveyed to Gloucester Gaol pending police-court proceedings. The affair caused intense excitement in the neighborhood of Stroud.—*Medical Times and Hospital Gazette*, February 8, 1896.

Small-Pox Hospi-
tal Burned by a
Mob.

A sensational article on the use of "antitoxin" serum in the treatment of diphtheria appears in a recent issue of the *Contemporary Review*, written by Mr. Demetrius Boulger, a well-known author of historical works, whose misfortune it was to undergo the treatment a short time ago. He asserts that in his case the injection of antitoxin was of no use in curing the diphtheria; that, though he had the injection twice, in maximum doses, the old-fashioned or "classical" cure for diphtheria was being employed *pari passu*,—i.e., a powerful chlorine gargle, with poultices for the throat, iron tonic, and frequent doses of brandy. The "old-fashioned" remedies he believes cured him. Up to leaving the hospital no secondary evil results from the antitoxin made themselves evident. But a few hours after leaving the hospital as cured, Mr. Boulger was warned that the cure of the diphtheria was only the precursor of a still more serious and

A Patient's Ex-
perience with
Diphtheria An-
titoxin.

protracted illness, and one which he feels was largely due to, and distinctly aggravated by, the employment of the antitoxin.

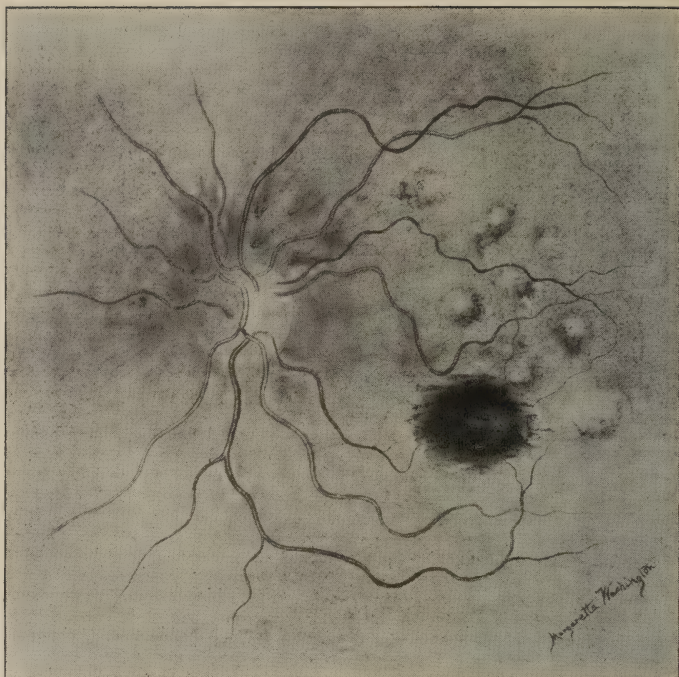
He writes: "The very day I left the hospital my voice became strange and articulation painful; but for several days nothing more happened, except an attack of staggers from a momentary sensation of powerlessness in the left leg, which should have told me what was coming on. Then followed loss of sight,—the eyes first showing weakness at a near distance, then at a long, and finally one eye after the other doubling the objects looked at. Six weeks elapsed before my exceptionally excellent sight returned, and, although I was told by the doctor I should probably have to use glasses, I am happy to say that no permanent weakness has followed. Difficulty in swallowing, culminating in the rejection of all solids or liquids, came on with the loss of sight, and was accompanied by an extraordinarily abundant eructation of white froth, quite distinct from phlegm, and resembling nothing so much as the foam of a horse. . . . Exactly one month after I left the hospital I lost the power of walking or standing up, and then, in another week, that of writing or using my hands in any way. During the next ten weeks I remained in an absolutely helpless state,—a sort of living death, with the brain clear and active, but the body useless,—and I owed my recovery entirely to the skilful treatment and kind intervention of the doctor who had cured me of diphtheria in the hospital. The employment of electricity at an early stage aggravated and completed the loss of nerve-power, and only absolute cessation of effort, change of air to the seaside, and far larger doses of strychnine than an ordinary practitioner would sanction, restored me to something like my original state of health."

Mr. Boulger imagines that his troubles were due to the serum with which he had been inoculated, it having been taken from a horse suffering from glanders, but in these columns it is scarcely necessary to say that he is altogether mistaken. The symptoms he describes so accurately and graphically are those of ordinary diphtheritic paralysis, which is a common sequela of true diphtheria, and which might occur in any case, whatever method of treatment has been followed.—*Medical Times and Hospital Gazette*, February 8, 1896.

Dr. Osler, as a sort of recreation from his purely medical work, has taken to the production of a type of writing peculiarly in vogue at the present time,—namely, that of historical and biographical sketches of medical men of by-gone days. The titles of three of these literary communications are John Keats, the Apothecary Poet; Thomas Dover (of Dover's Powder fame), Physician and Buccaneer; and An Alabama Student.

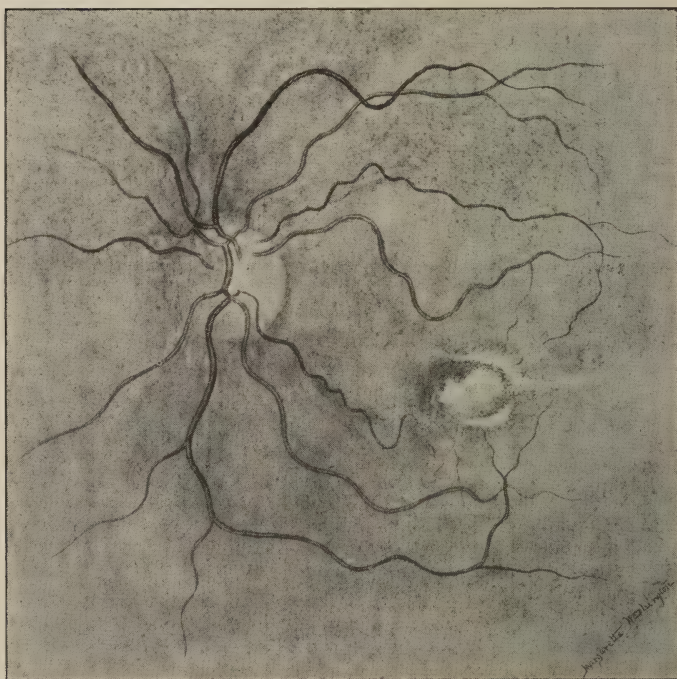
Dr. Osler and his
Biographical
Historical
Studies.

PLATE I.



Appearance of eyeground during hemorrhagic stage.

PLATE II.



Appearance of eyeground during stage of degeneration.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

MAY, 1896.

[No. 4.

ORIGINAL COMMUNICATIONS.

AN OPHTHALMOSCOPIC STUDY OF A CASE OF HEMOR- RHAGIC NEURO-RETINITIS.¹

BY CHARLES A. OLIVER, A.M., M.D.,

One of the Attending Surgeons to the Wills Hospital; one of the Ophthalmic Surgeons to the Philadelphia and Presbyterian Hospitals; Honorary Member of the Milwaukee Medical Society, etc.

THE accompanying phototypes represent the ophthalmoscopic appearances of an extremely interesting case that the writer has had the privilege to study during his terms of service in the ophthalmic wards of the Philadelphia Hospital.

On the 2d of April, 1895, M. McF., a sixty-year-old man, formerly employed as a dyer, gave the following brief history of his ocular condition: Three years previously, Dr. George M. Gould, the writer's immediate predecessor as one of the ophthalmologists to the hospital, removed the right eye for gumma of the ciliary body.

Some four years previous to this, as also shown by the hospital records, the case was under the care of my colleague, Dr. George E. de Schweinitz, who treated him for a double iritis, which rapidly became gummous in type, in the right eye. At that time, the left eye showed a diffused retinitis, and had a visual power of but $\frac{15}{100}$.

When the patient was first seen by the writer, he stated that the vision of the left eye had been steadily failing for three months' time, objects appearing as if they were seen through a mist, or as if they were placed in a cloud.

Direct vision for form was reduced to an uncorrectable $\frac{1}{50}$. The visual

¹ Sketches of case exhibited before the January, 1896, meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia.

fields for white and red, which were carefully taken by Dr. Wm. T. Shoemaker, one of the writer's friends and assistants, showed a decided excentric contraction, the greatest diminutions being in the upper and the lower nasal quadrants.

The pupil was ovoid, with its long diameter of two and one-half millimetres, situated at seventy-five degrees. The iris responded fairly well to light-stimulus and to efforts for accommodation. The anterior scleral veins were full and intra-ocular tension was normal. Extra-ocular muscle movement appeared good in all directions. Oblique examination made plainly evident the marks of an old iritis upon the anterior capsule of the lens.

With the ophthalmoscope, a most interesting and typical picture of hemorrhagic neuro-retinitis, with a just commencing glaucomatic cup, could be seen through the clear media. The details of fundus are so fairly shown in the first of the accompanying phototypes, which have been reproduced from two most excellently and faithfully painted water-color sketches, made by Margaretta Washington, of this city, that an extended verbal description is rendered unnecessary.

Here the irregular and unequal recession of the swollen tissues on and around the optic nerve-head; the just beginning pathological sinking of the outer half of the disk-substance, allowing the lamina cribrosa to be seen through the superjacent translucent structures; the immense fresh hemorrhage, about the size of the disk, with its upper edges and central portion showing the first effects of rapid absorption; the irregular line of degeneration and atrophy extending up and out from the large blood extravasation into a second much fainter hemorrhagic area; the clump-like blood-massings in the macular and supramacular regions; the flame-shaped extravasations into the fibre layer of the retina immediately above the disk edge; and the slightly cedematous condition of the peripapillary area, can all be fairly recognized in the details of the first of the two plates.

On the 17th of September, 1895, the patient was again seen by the writer. At this time, the ophthalmoscopic picture was so different that a new water-color drawing was made by Miss Washington.

As the additional data found in the notings taken at this time by the writer will serve to give a better idea of the conditions seen than the monochromic tint can alone, they are here given directly as written in the writer's case-book.

The nerve-head preserves the same red-gray tint, especially to the outer side, as at the previous examination. The retina appears much more degenerate, this being markedly seen in the temporal region and in and around those portions that have been previously occupied by the deeper-seated hemorrhages. The smaller retinal twigs appear more disturbed in their lateral curvings, this probably being caused by irregular retinal shrinkage and cicatrization. The lumen of the retinal vessels and the relative tints of their contained currents, do not seem to be altered in any way. The ectasia left by the large hemorrhagic mass extends in places directly through to the

sclera, and is bordered by irregular aggregations of pigment which are more dense to its outer edges, though more extensive to its nasal portion. The whitish band, extending over to the second and more peripheral area of degeneration, is more plainly evident, and the faintest superficial haze and somewhat irregular linings remain as the only vestiges of the large peripheral mass with which the great hemorrhage was connected. The excentric cupping of the nerve-head, though somewhat deeper than before, does not appear to be any more extensive than when previously studied.¹

At this time vision was reduced to the ability to see to count fingers in a small central field at one metre's distance.

The case is here presented from an ophthalmoscopic stand-point only, as offering an interesting example of the peculiarities of retinal, choroidal, and optic nerve-changes, that are produced from low-grade, inflammatory, and degenerative action, and that can be seen only by repeated and careful study of existent objective conditions.

THE PATHOLOGY OF CYSTIC TUMORS OF THE UTERINE ADNEXA.

BY WM. H. WATHEN, A.M., M.D.,
Louisville, Kentucky.

CYSTS in the uterine adnexa arise in the ovary, the hilum of the ovary, and in the parovarium, and are designated oöphoritic, paroöphoritic, and parovarian cysts.

Oöphoritic cysts arise from the follicles in the egg-bearing segment of the ovary; paroöphoritic cysts arise from the remnants of the Wolffian body in the hilum of the ovary, and parovarian cysts from the tubules in the parovarium, the remnants of tubules of the Wolffian duct.

It will thus be seen that, with the exception of oöphoritic cysts, all cysts of the uterine adnexa arise in foetal remnants that serve no useful purpose to the woman.

Until recently the etiology of all these cysts was supposed to be identical; hence the difficulty in appreciating the correct operative procedures necessary in their removal. Oöphoritic cysts are nearly always multilocular, generally have intracystic glandular growths, and I concur in the opinion of J. Bland

¹ At the meeting in which these drawings were exhibited, Dr. de Schweinitz showed a third sketch of the ophthalmoscopic appearance made for him by Miss Washington. In this drawing, made but one month later, the retina in the region of the second large and more peripheral hemorrhage had become finely granular, and was flecked with minute whitish points; a remarkable change for so short a period of time.

Sutton and others, that they arise in Graafian follicles, undergoing retrograde processes of development. In large cysts the wall is entirely fibrous, but in the smaller cysts the tumor is lined with stratified epithelium, and, when very small, by the *membrana granulosa*.

While in unilocular cysts the disappearance of the epithelium may be universal, in multilocular cysts of long standing abundant epithelium may be found lining some of the loculi.

Oöphoritic cysts may be unilocular, but I am impressed with the belief that they are primarily or at some stage of their existence multilocular, the partitions or walls of small cysts having been destroyed. Many of the so-called ovarian unilocular cysts are parovarian cysts. Some of the loculi in multilocular oöphoritic cysts may be small, while others are as large as a melon. They are filled with viscid fluid identical in physical character with mucus.

Unilocular and multilocular dermoid cysts also arise in the ovary and may contain one or all of the following characteristics,—namely, bone, teeth, hair, sweat-glands, sebaceous glands, horn, *mammæ*, unstriped muscle, and tissue histologically identical with brain matter, hair, teeth, and bone, however, being most frequent and most abundant. The teeth are usually found embedded in loose bone, resembling alveolus, and are developed on the same plan as teeth in the normal situation; they may be few or many.

The bones found in the dermoid tumors and in extra-uterine pregnancy should not be confounded, if we remember that no well-defined bone of any part of the human body is developed in a dermoid growth.

Oöphoritic cysts are nearly always pedunculated, dermoid cysts less frequently so, and they are sometimes found deeply embedded or adherent in the pelvic structures.

These tumors, in timely operations, can usually be removed without difficulty, but the dangers multiply by delay, which causes complications that render the operation difficult, and often fatal,—namely, adhesions to the omentum, the pelvic structures, the abdominal walls, the intestines, the mesentery, the liver, the spleen, and, by pressure, disease of the kidneys; they may suppurate or cause pyosalpinx or pelvic abscesses.

As parovarian cysts arise in the cæcal tubes of the parovarium, which lie in the folds of the broad ligament, these tumors are necessarily in their early stages intraligamentous, and while they usually ascend above the pelvis and form a pedicle, this is not universal, and in some instances well developed parovarian cysts may be apparently as completely intraligamentous as are cysts of the hilum of the ovary. The union of the cyst wall to the investing capsule, however, is not firm, and the tumor may be easily enucleated without injuring any viscus, and without extensive hemorrhage.

These tumors are generally unilocular, of slow growth, do not form adhesions rapidly, and may continue for many years without serious inconvenience to the patient. They are more easily removed, and the mortality is lower than in the removal of any other tumors of the uterine adnexa.

The reverse is true of tumors that arise in the hilum of the ovary, for these cysts unfold the layers of the broad ligament, burrow deep into the pelvic and peritoneal connective tissue, and may become so intimately blended with the adjacent structures as to be almost a continuity of structure,—the uterus, ureters, bladder, deep pelvic vessels, and intestines.

It is sometimes impossible to enucleate these cysts from the investing capsule without injury to ureter, bladder, blood-vessels, or intestines. The ureter has been found lying in front of the tumor, between the wall and the capsule, and has, upon more than one occasion, been divided in making the incision through the capsule.

The cyst may separate the peritoneum anteriorly from the abdominal wall, or separate it posteriorly, opening the mesorectum, the mesocolon, the mesentery of the small intestine, or pass under the cæcum and ascending colon.

We sometimes find a net-work of vessels the size of goose-quills coursing over the capsule of a large embedded cyst of the hilum. This condition is especially well marked where the tumor has unfolded the mesentery so that the bowel lies directly in contact with the cyst wall.

These tumors never have a pedicle and cannot be removed except by enucleation of the cyst wall from its attachment to the capsule and other structures, always being careful to avoid wounding the ureter, the bladder, deep-seated vessels, or intestines. The operation may be as difficult as any in surgery, and should not be undertaken by any one except an experienced abdominal surgeon; otherwise the patient may die on the operating-table or from accident because of ignorance of the correct technique.

As I do not wish to consume the valuable time of the reader, I will conclude with the report of one case, selected from many, to illustrate the dangers of delay in operating for tumors of the uterine adnexa; the necessity for timely operations applies with equal force to other pelvic and abdominal diseases.

While there is too much laparotomy done and too many men are doing this kind of surgery without proper training, there are, nevertheless, many excellent physicians who advise patients not to be operated upon until conditions or complications have arisen that add greatly to the dangers of the operation, and may cause the death of the patient.

I operated on Mrs. N., Salem, Indiana, ten days ago, with the following history: Thirty-nine years old, married, the mother of six children, the last ten weeks old. Two years ago she noticed a tumor in the right inguinal region, which slowly but continuously increased in size until she came to the Kentucky School of Medicine Hospital for operation. Since the birth of her last child the tumor has enlarged more rapidly, and when I first saw the patient the abdomen was as large as in pregnancy at seven months. For six weeks she had but little desire for food, and her digestion and assimilation were bad; her weight, deducting the weight of the tumor, did not exceed eighty pounds. She suffered severe pain in the ab-

domen ; her temperature varied from 100° to 103° F., and her pulse from 110 to 125. When the abdomen was opened the omentum, immediately under the incision, was found firmly and broadly adherent to the abdominal and the anterior surface of the tumor. Upon separating the adhesions from the wall an opening was found in the cyst from which was discharged nearly two gallons of pus containing a bunch of hair as large as the fist, thus showing the cyst to be a suppurating dermoid. The omentum was so extensively and firmly adherent to the cyst wall that it was necessary to ligate it in sections and remove it near the bowel. The cyst was then found to be adherent to the ileum, the sigmoid flexure of the colon, and to several parts of the mesentery, necessitating prolonged and careful dissection to remove it and prevent fatal injury to these vital structures. After thorough irrigation with hot sterilized water the incision was closed, and she was removed from the operating-table with a pulse of 140, but suffered no severe shock, and in forty-eight hours her pulse was 75, and temperature normal ; she passed gas in thirty-six hours, has had no untoward symptom, and will make an uninterrupted recovery. The suppuration was probably due to traumatism during labor, and but for the omental adhesions the woman would have died from diffuse suppurative peritonitis, and had she delayed operation a little longer, rupture would doubtless have occurred notwithstanding these adhesions.

DILATATION OF THE STOMACH.

BY H. C. CROUCH, M.D.,

Denver, Colorado.

AMONG the various pathological conditions of the stomach, one frequently wrongly diagnosticated, and even more frequently failing to meet the recognition of cause and consequences, is that known as dilatation. Any effort to bring more clearness into a subject, by no means necessarily so obscure as it seems at present, appears to me to require no further justification, and although I have very little to present that is actually new, nevertheless, some of the results of the more accurate methods of diagnosis in diseases of the stomach are sufficiently unfamiliar as to have as yet failed to find their place in the general works on medicine.

Dilatation, as a word, would seem to be self-explanatory. As a clinical entity, it requires much explanation. Any enlargement of the capacity of the stomach might seem to justify the term dilatation. Apart from the fact that an increase in capacity may be very apparent and yet be absolutely outside of the pathological, it may be remarked at the outset that the important factor in the conditions usually diagnosed as dilatation is not dilata-

tion at all, but stagnation; and as this is the one important fact in conditions which often differ widely in cause, and more widely still in dignity, we might do well to banish altogether the term dilatation, as representing a morbid entity. In fact Boas, in the last edition of his treatise, has actually done this. However, Klemperer remarks, it is difficult to banish a term so generally accepted, and which presents certain conveniences, so that if we are still obliged to use it, we may at least insist upon a more exact definition of the clinical meaning, and an emphasis of the fact that it is only a symptom, important only as associated with other things. Let us, then, endeavor to define the clinical meaning of dilatation. When, from any cause, food and liquors cease to pass from the stomach at the proper time or with sufficient rapidity or completeness, they stagnate and accumulate, producing an enlargement and distention of the organ, and this condition we recognize as dilatation. A very little consideration suffices to realize that stagnation is the important fact, and that only by recognizing its presence are we enabled to differentiate between a pathological dilatation and other conditions where the capacity of the stomach is increased, but which do not constitute a source of such serious harm to the organism. In fact, we may sometimes have a high degree of stagnation, producing all the phenomena associated with dilatation in a stomach not as yet enlarged, and which would fail to be recognized as dilatation. Stagnation, then, being the important factor, how do we recognize it, and when is it sufficient to be of importance? If the food at one meal fails to pass from the stomach before another meal is taken, it may be said that there is stagnation. This, however, often occurs when the interval is short. In a longer interval, particularly that between the evening and the morning meal, the stomach empties itself completely, and there is then no permanent stagnation. If, however, even in this interval the stomach does not become empty, the food stagnates, and the phenomena accompanying dilatation ensue. This, then, we may take as the principle in determining the existence of stagnation. When the stomach is not found empty in the morning, after one ordinary meal taken the night before, there is stagnation, and consequently, in the clinical sense, dilatation,—and usually in the mechanical sense as well. In practice, this is an extremely important part of the examination. An ordinary test-meal of bread, meat, and tea is given at the usual time in the evening, and the contents of the stomach, if there be any, are drawn off the following morning. In addition to the information relative to the motor function, important facts concerning the chemical functions result from such an examination.

Dilatation with stagnation being, as we have remarked, only a symptom, let us examine under what conditions it exists, and, first of all, what conditions are not, properly speaking, to be classed as dilatations. On ordinary examination, even simple inspection will often show the greater curvature in a position much below the normal. Palpation will demonstrate the position with some accuracy through the sound of succussion clapotage.

On the strength of this, dilatation is often diagnosticated. In dislocation of the stomach, *descensus ventriculi*, as it occurs most frequently in women who have borne children, and often associated with floating kidney, we frequently find such conditions. The dislocated organ is often very flaccid and somewhat enlarged, and yet, in the absence of the cardinal symptoms of stagnation, it would be a grave error to pronounce this dilatation. A condition even more frequently seen is that of muscular atony or *myasthenia*, and is met with particularly in *neurasthenic* and *phthisical* or *ex-phthisical* patients, the greater curvature reaching the umbilicus or slightly below when the stomach is full. Palpation elicits the sound of *clapotage* during the whole digestion period, and an examination may further show the presence of food long after the time at which it should normally be discharged. Such cases have been brought to me with the diagnosis of dilatation, and certainly in such cases there is, in a strict sense, dilatation. Yet during the night the stomach discharges its contents more or less perfectly. The important symptom of permanent stagnation, the source of the grave trouble in pronounced dilatation, is missing, and we must separate this condition as sharply as may be from the clinical picture of dilatation. The difference in gravity of these conditions is obvious, and yet the difference in kind is merely of degree, for conditions of *myasthenia* may become aggravated so that food is no longer discharged during the night, and we have then a form of dilatation due to stagnation and accompanied with the severer symptoms, the vomiting, the anorexia, the thirst, the emaciation, that make up the clinical picture of dilatation.

Dilatation may be considered due to mechanical insufficiency, the failure of the muscular apparatus of the stomach to discharge the contents completely. It is evident that this may be due either to the inability of the muscular coat to perform normal work, simple *myasthenic* dilatation, as already mentioned, or it may be due to an increased demand to which a normal muscular apparatus finally has become unequal. The most common cause of such a condition is found in some obstacle, particularly stenosis of the pylorus or duodenum, either *cicatricial* or consequent on some tumor, malignant or otherwise.

The determination of the nature of dilatation is of immense importance in reference to treatment. Above all, the question of surgical interference is to be taken into consideration in suitable cases, and such cases are constituted by conditions of stenosis and tumors. Particularly in *cicatricial* stenosis, the results of a well performed operation are among the most brilliant in abdominal surgery.

An exact diagnosis is consequently of immense practical importance, for, in addition to the question of surgical interference, appropriate treatment is very effective in alleviating and relieving the patient's troubles.

Let us, then, consider briefly the more common conditions, and the means of differentiating. Dilatation is most frequently one of three conditions. In the first place, it may be due to primary muscular insufficiency,

and is what we have referred to as atonic or myasthenic dilatation. In the second place, it may be due to cicatricial stenosis of the pylorus, or, exceptionally, the duodenum, following usually a gastric or duodenal ulcer, or the introduction of corrosive substances. In the next place, it may be due to a tumor of the stomach, ordinarily cancer, involving the pylorus. It may be remarked that in this case both of the factors producing dilatation are at work,—viz., a pyloric obstruction and a weakening of the muscular coat; for it is remarkable how early cancer affects the motor function of the stomach. Omitting, for the sake of brevity, the more uncommon conditions, where the obstruction is constituted by a tumor or inflammatory conditions outside of the stomach or duodenum, the means for differentiating these conditions alone may be considered here. Dilatation is due to carcinoma. The cause is easily enough recognized where there are a palpable tumor, advanced cachexia, the hemorrhage, and other classical symptoms. Unfortunately, such cases are usually hopeless. It is evidently of greater importance to have some means of at least suspecting the existence of malignant disease at an earlier stage. Important information is afforded here by a clinical examination of the contents of the stomach. In simple dilatation, either atonic or due to cicatricial obstruction, the contents show certain peculiarities on inspection. Usually copious, they are always in a condition of fermentation, and, in a glass vessel, show a characteristic division in three layers, and have a distinctly acid smell, like that of yeast or beer. If you examine you find that the contents of the stomach in carcinomatous dilatation undergo a decomposition rather than simple fermentation, are often offensive to the smell, and show either a very low amount of hydrochloric acid or none. Of value, especially in the earlier stages, is the presence of lactic acid, the importance of which in the diagnosis of carcinoma was first recognized by Boas. Contrary to the usual teaching, lactic acid, except as introduced in the food, is at no time present in the stomach in appreciable quantities. Lactic acid fermentation, to produce appreciable quantities of lactic acid in the stomach, requires two factors: the absence of hydrochloric acid and stagnation, both of which occur so much more frequently in cancer than in any other condition that practically the presence of lactic acid, when the proper precautions have been taken, justifies a strong suspicion of cancer. It is necessary, in the first place, to select for the test-meal a substance free from lactic acid. This, in accordance with the practice of Boas, is oatmeal gruel. The stomach is thoroughly washed out, the test of oatmeal is given in the evening, the contents of the stomach examined the next morning for lactic acid, either by the Uffelmann reaction, or, in doubtful cases, by Boas's aldehyde test. While the absence of lactic acid does not necessarily exclude cancer, the presence of lactic acid is very strong presumptive evidence of its existence. Microscopically, the abundance of sarcinae and yeast in non-malignant dilatation, their greater rarity, and the presence of long zigzag-shaped bacilli, confirm the chemical examination. In addition, the course of the disease,

the age of the patient, and the existence of fugacious œdema assist in the differentiation.

It being possible in the majority of cases to distinguish between malignant and non-malignant dilatation, it remains to ask whether we can distinguish with equal certainty between idiopathic myasthenic dilatation and that secondary to a stenosis. It must be admitted that this is a most difficult problem. There are, however, certain points which materially aid in its solution. The history is important. The principal occasion of non-malignant stenosis of the pylorus being a precedent ulcer, a history pointing to such a condition, hæmatemesis, tarry passages, a circumscribed pain, which may likewise be present long after the ulcer is healed, would indicate a cicatricial stenosis. A greatly exaggerated and visible peristalsis is, when it is present, suggestive of an obstacle at the pylorus. In a certain number of cases, careful palpation may discover the cicatricial enlargement or bands of retracting tissue. The course of the disease is somewhat different. In myasthenia it is long in developing, there are frequent remissions, the degree of dilatation is less, and the response to treatment more prompt. Possibly this last condition is of the most value, for, when a rational treatment fails, the question of surgical interference must be raised, and, in such a case, an operation would be equally indicated in very severe myasthenic dilatation, and in a cicatricial stenosis.

A few words in reference to the treatment of dilatation. It is not my intention to go into the treatment at length. It may only be observed that washing out the stomach, a proceeding so often unnecessarily employed, and, in fact, so very often misused, finds here its principal field of usefulness. I have wished, however, to emphasize the surgical aspect of dilatation and the necessity for an early consideration of operative interference in all suitable cases. Even in cancer, where a radical operation may be hopeless, the relief afforded by gastro-enterostomy is so great that it is to be recommended in all cases of pyloric obstruction. The improved technique has made the operation of gastro-enterostomy in skilled hands one of the simplest of abdominal operations, and the reports from more recent operations by Hahm, Kocher, Murphy, and others give brilliant results. In carcinoma, particularly with pyloric obstruction, the advisability of the operation cannot be dwelt upon with too much emphasis. A permanent relief from the most painful symptom of stagnation, a prolongation of life, ending in an easy and painless death, a fading away, as it were, instead of a prolonged agony,—these more than justify such an operation.

CLINICAL LECTURES.

INTERNAL AND EXTERNAL URETHROTOMY.

CLINICAL LECTURE DELIVERED AT THE SOUTH SIDE (PITTSBURG) HOSPITAL,
FEBRUARY 2, 1896.

BY J. D. THOMAS, M.D.,

Professor of Genito-Urinary and Venereal Diseases, Western Pennsylvania Medical College, Medical
Department Western University; Surgeon and Genito-Urinary Surgeon to South Side Hospital.

GENTLEMEN,—The first case I present to-day has the following history :
“M. M., aged forty-three, Irish. About eighteen years ago, while carrying a
hod, he was standing on a wall about eight feet high, when he slipped and fell,
the wall gave way, and he lit astride a mass of rocks. Following this he
suffered severe pain, the pain radiating from his right testicle up along the
right side of his body. He consulted a physician, but derived no benefit.
He then entered a hospital and remained for a few weeks, but, as he became
continually worse, his right testicle was removed, as it had gotten so large
that ‘it ruptured his scrotum.’ About ten years ago he acquired a gonor-
rhœa, which has never been cured, but it did not give him much trouble
until four years ago, when he observed that he was unable to pass as large
a stream from his urethra as he did formerly. About a month ago he fell
from a ladder, a distance of nine feet, and was sent to a hospital; he re-
mained in the hospital but a few days, as he only suffered from a ‘shaking
up.’ After leaving the hospital the trouble in urinating became aggravated,
and twenty days ago he was sent to Marshalsea,—the city almshouse.
Thirteen days ago he was seized with retention of urine; an effort was made
to enter the bladder, but failing to succeed, the medical gentlemen in at-
tendance aspirated above the pubis, to relieve the over-distended viscus.
This operation had to be repeated five times, when the patient was able
again to pass his urine himself. Received in this hospital January 30,
1896.”

On the evening of the day of his entering the hospital he suffered from
retention, when the resident physician attempted to relieve him with a
catheter, but failed to introduce the smallest instrument. He then sent for
me, but, as it was not convenient for me to respond, I sent word to aspirate
the bladder, and repeat the operation in the morning, if necessary. Gentle-
men, the suprapubic aspiration of the bladder is a very safe operation, if
the needle is pure and the surface to be aspirated is sterile. This being the

fact, you need never lose your heads when you fail to enter the bladder by the natural route. The object is to *save the bladder*; if you do this you can afford to wait until the proper time and condition arrives for you to treat radically the obstruction in the urethra. Of course, this rule does not apply when there is extravasation or infiltration of urine, which requires immediate action. When I made my visit to the hospital, the next morning, I found that it had been necessary to aspirate again, but I found the patient fairly comfortable, and with a normal temperature.

After getting the history of the patient, I made a systematic examination of the urethra. The circumference of the penis was three inches; this would give a urethra with an approximate measurement of thirty millimetres in circumference, as I have heretofore explained to you. The largest bulb admitted was a No. 18 French, which stopped immediately within the meatus. No. 11 passed through this and stopped at six inches. While passing the No. 11 bulb between the two points mentioned, I very distinctly observed that the entire urethra was irregular from inflammatory exudates. I then used bulbs of diminishing sizes until No. 8 was reached, but none would pass farther than six inches. I then resorted to soft bougies, and succeeded in passing a No. 5. This was removed and a No. 6 passed. After removing the No. 6, the patient arose from the bed and urinated himself. As the stream was small, it, of course, took him some time to empty his bladder. Since then (that was day before yesterday) the patient has emptied his bladder by his own efforts.

Now, gentlemen, this is a case that demands relief. If left alone, he will again have retention, his bladder will, in time, become inflamed, the trouble will pass to the ureters, the pelves of the kidneys, and, finally, the kidneys will become disorganized. Up to the present these organs are not damaged. It is useless to treat this case by gradual dilatation, because the whole urethra is infiltrated by a more or less dense inflammatory exudate, and these points of exudation are so numerous and close that you cannot locate them separately; hence I will incise the deepest contractions through the perineum, and the anterior ones within the urethra,—in other words, do an external and internal urethrotomy.

The patient being now anæsthetized, I fill the urethra with oil, and pass this, filiform. You observe that it catches after passing about six inches. I now pass another filiform, which also catches. I take a third, which does the same thing. Before passing any more, I will manipulate these by withdrawing them slightly and separately, and again advancing them. I now find that one of these filiforms has entered the bladder. I know that it has entered the bladder because it slides to and fro smoothly: if it were in a false passage or a pocket or an open follicle, it would recoil. After removing the other filiforms I slide over this one a tunnelled sound, which passes down against the face of the smallest stricture. We will now have the patient brought to the edge of the table and placed in the lithotomy position. The perineum has been prepared beforehand. I now place my left

index finger upon the end of the tunnelled sound, to locate it, and cut along the raphé until the tip of the sound is exposed. By holding open the lips of the wound the dark filiform is visible at its bottom, passing from the end of the sound. I now follow this filiform for a short distance, cutting with the point of the knife. Laying aside the knife, I take this grooved director and insinuate it along-side of the filiform until it enters the bladder. The filiform is now removed, and along the groove in the director I make a free cut, along the floor of the urethra, in the direction of the prostate. Removing the director, I now pass my index finger into the bladder, dilating to a certain degree the membranous and prostatic urethra. As the anterior urethra is too small to admit the Otis urethrotome, I will be obliged first to pass this Maisonneuve urethrotome, bringing the point out through the perineal wound. With this instrument you cut from before backward. I place the blade in the slot, as you see, and push it downward until the blade is visible in the perineum, thus incising the entire floor of the urethra, from the meatus to the wound in the perineum. I now remove this instrument, and you see I am enabled to pass the Otis instrument, bringing its point also out at the perineal wound. The instrument is now opened until the urethra is put upon the stretch, when I draw the knife from behind forward, incising the entire roof of the urethra. Removing the Otis instrument, I take this No. 30 sound and pass it into the bladder with ease. Although a good deal of cutting has been done, the hemorrhage is not great, the only vessels requiring torsion being one or two superficially in the perineum.

The after-treatment of this case will be the passage of a full-sized sound into the bladder every third day until the wounds have healed. The urethra will be syringed with an antiseptic solution every day, and the wound in the perineum will be kept clean and douched with a bichloride solution, one to four thousand. I do not introduce a drainage-tube through the perineum and into the bladder unless there is some special indication for it. The dilatation given the deep urethra by the finger causes incontinence, and hence perfect drainage, for the first few days, and the urine passing over the wound keeps it thoroughly irrigated. My experience with these wounds, treated in this way, is most satisfactory. Sometimes the patients leave the hospital, perfectly well, in a little over two weeks.

The second case I present is that of C. J., aged thirty-two years. He denies ever having had gonorrhœa. His present trouble dates back about four years, when he was injured in a coal-mine by a fall of slate, the slate catching him in the back. After the accident he was unable to void his urine, when a physician was called in, who passed a metallic catheter into his urethra; while manipulating it a piece of the catheter broke off, or became detached, the patient does not know which, and it took an hour or two of hard work before it was recovered, after which the patient bled freely. Why there was retention of urine after the accident I do not know. The

injury did not appear to be a very serious one, for a physician was not called until the patient found that he could not urinate, and there is no history of blood passing from the meatus before instrumentation. It sometimes happens that patients who receive bruises about the lumbar and abdominal muscles are unable to void their urine when there is no actual injury to the urethra or bladder. It may be that in this case there was a rupture of the urethra, but from the history connected with the catheter I suspect that the injury to the urethra was done at that time; at all events, it impresses us with the lesson that our urethral instruments must be in good working order and manipulated with extreme care and intelligence.

Since that time the patient has had apparent incontinence of urine, but I think it was mostly due to overflow. For two years he has been obliged to be an outcast, from the fact that his garments are always saturated with urine, and when he succeeded in securing a boarding-house, after one night's lodging he would be driven off, owing to the condition in which he would leave his bed. Although he has been working the greater part of this time, he has been obliged to do the most of his sleeping in out-buildings. He says that he has consulted quite a number of physicians, but none were able to pass an instrument into his bladder. He finally fell into the hands of Dr. Bryant, of Washington County, who sent him to me, after failing in his efforts to pass the obstruction in the patient's urethra.

After the patient entered the hospital, an examination showed a healthy urethra, calibre 32 French, extending back seven inches, where the obstruction was encountered. The meatus was rather small. As it was proposed to treat the obstruction by external urethrotomy, very little effort was made at this time to pass the stricture, but enough information was obtained to satisfy me that there might be some difficulty in the undertaking.

On January 1, of the present year, he was anæsthetized, and after working with the filiforms for nearly half an hour I succeeded in insinuating one into the bladder. At this moment the patient ceased to breathe, and it required several minutes of pretty anxious effort before he began breathing properly. The ether was again administered and the patient brought to the edge of the table for operation on the perineum, when he again went into a dangerous condition, and artificial respiration and other methods were practised for some time before he was out of danger. Fearing to give the patient any more ether, I immediately did a modified operation. I passed a tunnelled Thompson's divulsor over the filiform that had been passed into the bladder, divulsed the stricture up to No. 20, and incised the meatus to No. 34, in order that gradual dilatation might be practised. Gradual dilatation has been done since then (a space of twelve days), with satisfaction, so that to-day a No. 28 can be passed.

Since I have been using the sounds, I have noticed that the point of the sound enters a pocket on the under surface of the urethra at the location of the stricture. At first a little difficulty was experienced in passing this pocket, as the point of the instrument entered it and was caught. By pass-

ing a finger into the rectum, then withdrawing the sound slightly and raising the point of the instrument with the finger in the rectum, I acquired the knack of passing the sounds readily. It was hoped that as the sounds increased in size the pocket would spread out and disappear, but it is just as marked with the No. 28 as it was with the No. 20. If this pocket did not exist, gradual dilatation would be continued until a No. 32 sound, the patient's normal size, could be passed readily.

You will find in your reading that the treatment of deep strictures by divulsion followed by gradual dilatation is almost universally condemned. Practically you will often find it an excellent method. I have performed it quite a number of times, and *always* with excellent results. It would be unsafe to permit this patient to go out into the country with this pocket in his urethral canal (although at the present time he believes himself to be perfectly well, being able to pass a large stream and to retain his urine for six hours), for if at any time it should become necessary to pass a catheter, it would probably catch in this pocket, and if the efforts to advance it were persisted in, a false passage would be made, and the patient again placed in a deplorable condition.

The patient is now ready, and you observe that he has taken the ether fairly well. The guide I shall use for this case is a No. 24 sound, with a groove on its convex surface, which will serve to conduct the point of the knife. Now you will observe where the instrument catches. I introduce my left index finger into the rectum, withdraw the instrument slightly (out of the pocket), lift its point with my finger-tip, and it glides in. As in the preceding case, my incision follows the raphé, the median line, and the point of the knife soon reaches the groove in the guide. I make a straight incision backward along this groove until I am satisfied that the pocket has been "cut out." I now take this No. 32 sound, and you see that it passes readily into the bladder. This sound will be passed every third or fourth day until the wound has healed.

The third case I bring before you is that of P. M., aged forty-nine. He gives a history of having had gonorrhœa a number of years ago. He has been treated for stricture by gradual dilatation in England. He entered the hospital on December 13, 1895, with the history of having had a gonorrhœa for five weeks. His first gonorrhœa he acquired twenty years ago, his second five years ago, the present attack being his third experience in this line. The discharge was not very profuse, and he was placed upon a zinc and lead injection. As the discharge did not cease, I examined the organ carefully. The circumference of the penis was three and one-fourth inches. The largest bulb admitted by the meatus was a No. 18, which stopped immediately; No. 17 passed for one and one-half inches; No. 15 stopped at six inches; No. 14 passed this and met with no further obstruction. Gradual dilatation was practised up to No. 18, when it was necessary to in-

cise the meatus, which was done to No. 34. Gradual dilatation was continued until No. 32, the full size, was reached.

Now comes the principal feature in this case. The stricture, which is located one and one-half inches from the meatus, being annular and one-half inch wide, still presents to the touch, when the sound is introduced, the sensation of a hard or fibrous ring. It is just as difficult to introduce the No. 32 sound through this contraction to-day as it was the first time it passed: the stricture recontracts; it is resilient. We have reached the limit in passing sounds, for we are up to the full calibre of the urethra. Every time we pass the sound now the stricture is simply pushed into the soft surrounding tissues. The only thing to do with this stricture is to cut across it, incise it, do an internal urethrotomy. The deeper stricture, which is at six inches, will not need incising, for it obeys the treatment by dilatation. If I were to incise it, I should do so through the perineum. Internal incision of these deep strictures is said to cause a great deal of trouble from hemorrhage. Personally, I do not know, for I have never so incised them. The stricture that I propose to incise is called one of large calibre. Some would ignore this stricture, believing that it could not interfere with the function of urination. A pathological lesion always interferes with the function of an organ. The urine is discharged in great part by the vermicular action of the urethra, and this indurated tissue interferes with that action. Besides this, if left alone, it will, in all probability, keep up a gleety discharge, and it will rapidly recontract. Will incising the stricture cure it? If done thoroughly it probably will. Cutting this induration permits a normal nutrition to take place, and makes it possible for the absorbents to remove it. You will notice the same principle in old ulcers of the leg with indurated margins. By splitting this induration transversely with a sharp knife, a healthy process is set up, and the induration *disappears*.

It is not necessary to give a general anæsthetic in this case: cocaine will answer the purpose perfectly. I have here one grain of the drug dissolved in two drachms of distilled water. I will throw into the urethra one-half of this, retain it for about five minutes, and then throw in the other half, allowing it also to remain a few minutes. The instrument commonly used for internal urethrotomy is the Otis dilating urethrotome, which I used in the first case to-day, and you saw how admirably it did the work.

Although the Otis urethrotome is recognized as possibly the best instrument presented to the profession for severing strictures of large calibre, it has, in my experience, three faults: first, that after the knife or blade is drawn forward and made to cut the stricture, it has to be pushed back; second, it must be readjusted for each stricture after the first is cut; and, third, owing to the fact that it opens on the principle of a parallel ruler, the adjustment is slightly altered after it is opened from what it was when first set for the stricture.

The first objection is the most serious one. Although it is intended, when the blade is pushed back, that it shall traverse the same line as was

made by the forward cut, in practice it does not do so, but goes back along a *new* line; for the loose character of the tissues of the penis makes this unintentional cut unavoidable, and, as the distal end of the blade is somewhat dull, it makes, in addition, the cut a lacerated one. The second objection is not such a serious one, but the readjustment takes time and necessitates needless and hence injurious manipulation of the urethra. The third objection is a trivial one,—but an objection, notwithstanding.

With my improvement, which is here described, these objections are all overcome. The rod slides to and fro in the slot in the upper bar of the instrument. The blade is slid forward on top of this rod, and, when the instrument is closed and ready for introduction into the urethra, the blade is beyond the end of the rod, down in the slot, and out of the way. The urethrotome is then introduced to the bottom of the penile urethra—to the bulb—and opened, regardless of the location of the stricture or strictures. The seat of strictures having been previously located, the rod is drawn forward until its extremity is at the point of deepest stricture, and fastened in place with the screw; then the blade is drawn forward, and, when it arrives at the extremity of the rod, it rides up on this and cuts the stricture. The rod is now released and drawn forward to the seat of the next stricture, and again fixed with the thumb-screw. When the rod is drawn forward the blade always drops into the slot and is out of the way, so that it can be drawn forward, and when it arrives at the rod it rides upon it and cuts the next stricture. When there are more than two strictures the same process is gone through with until all strictures are cut,—always cutting the deepest first.

It is not necessary to have any markings on the rod to indicate where the strictures are, for they can be located for the blade by deducting the distance from the meatus to the strictures from the length of the rod,—*e. g.*, if a stricture is at five inches, the rod being ten inches, five inches of the rod is left outside of the meatus, and when the blade is drawn forward it rises to exactly where we want it,—at five inches.

The improved instrument has another advantage over the original Otis, —when the blade and rod are removed it is easier cleaned.

Having had some experience with the instrument, I find it works admirably.

To know that the blade has dropped into the slot it is only necessary to draw the proximal end of the rod one inch beyond the same end of the knife.

I will now pass this instrument to the bulb. The far side of the stricture being two inches from the meatus, I adjust the distal end of the rod a little beyond that by having the proximal end of the rod seven and one-half inches from the meatus (I use this stiff rule), tighten up the set-screw, and draw the blade forward. The handle of the blade is now on a line with the proximal end of the rod and just ready to rise and cut the stricture. I now draw the knife forward for the distance of an inch, and I know the

blade entered a little on the far side of the stricture and stopped a little on the near side, splitting it. Now, instead of pushing the blade back, I release the set-screw, draw the rod out on a line with the proximal end of the blade-handle, and I know that the blade has dropped. I now remove the instrument and introduce a No. 32 sound. This sound will be introduced every third day for two weeks, and then at longer intervals if needed.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

The Genesis of Hereditary Syphilis. (*Archiv für Dermatologie und Syphilis*, 1896, vol. xxxiv., No. 1.) By Dr. Caspary, of Königsberg.

The author reports four cases that bear upon the question of placental transmission. In the first the husband infected his wife at the nipple during a relapse, after he had been wholly free from symptoms at the period of impregnation. The child was born at term and was apparently healthy, but on account of the sore upon the mother's breast it was artificially fed. It died at the age of four weeks of gastro-enteritis, and a careful autopsy failed to show any sign of syphilis in any organ. Obviously in this case the spermatozoa were not infected, and the placenta acted as an efficient protection against the syphilitic virus in the blood of the mother. In two other cases the women presented themselves at the clinic in advanced pregnancy, both suffering from recent lesions, and each declared that the father of the child was perfectly healthy. Both children were born apparently healthy, but both died in early infancy. Careful autopsies failed to reveal any sign of syphilis. In the fourth case the mother was infected in the fifth month and suffered from very slight secondaries. The child was syphilitic. Caspary concludes that the placenta interposes usually, but not invariably, an efficient barrier to the passage of the syphilitic virus. He next discusses the question as to whether these children are immune, and concludes from the consideration of some reported cases that probably they are not. He further declares that the converse of Colles's law has many exceptions.

Contribution to the Knowledge of Congenital Syphilis of the Liver in the New-Born. (*Wiener medicinische Wochenschrift*, February 22, 29, and March 7, 1896.) By Karl Hochsteiner, M.D.

The author studied one hundred and forty-eight cases of hereditary syphilis in children in the first year. Forty-six had enlarged livers that could be recognized clinically, and of these, thirty recovered and sixteen died. Post-mortem examination was made of five of the latter, and in one case the enlargement was found to be tuberculous. The size of the liver was very variable and usually the spleen was also enlarged. The other symptoms were chiefly florid syphilitic exanthemata, bone-disease, commonly manifest as a pseudo-paralysis and inflammation of the bones of the hands and feet, and invariably a purulent rhinitis. Icterus and ascites were never present, and usually their absence is also noted in the cases reported in literature. The author then examines a number of reported cases in which jaundice was present, and reaches the conclusion that, whenever it exists in connection with enlargement of the liver, other certain signs of syphilis are absent. This is true of three cases of his own, two of which ended fatally and one in complete recovery. Regarding the histology, "vasculitis" is the dominant morbid condition. The treatment used was iodide of mercury by the mouth, with most excellent results in a large proportion of the cases.

The Hæmotherapeutics of Syphilis. (*Therapeutische Wochenschrift*, January, 1896, No. 3.) By Professor Neumann, of Vienna.

As syphilis is a disease of the human race exclusively, all the conditions that are usually considered essential in the application of serum therapeutics are absent. The natural immunity of animals, however, leads to the attempt to utilize their serum for healing purposes. Certain doubtful beneficial results have been reported and many failures. It is, however, *a priori*, unlikely that any substances that are antitoxic to syphilis are contained in the serum of animals naturally immune. It was next attempted to produce a reaction and artificial immunity with the presence in the serum of a real antitoxin, by injecting into the lower animals blood drawn from fresh cases of syphilis or implanting excised chancres and other local lesions in their tissues. The serum thus produced seemed to possess a certain efficiency in curing secondary lesions, but the results were irregular and to some extent doubtful. It is important to decide whether the lower animals are inoculable. Experiments can only result in three ways: 1, negatively; 2, by producing symptoms of general intoxication; 3, by producing true syphilitic lesions. The last possibility is as yet unknown; if, however, the second occur and can be increased by reducing the resistance of the animals, it is not impossible that a serum can be obtained that has some therapeutic value. It has been contended that, as syphilitics in the tertiary stage are themselves immune, their blood must contain some antitoxic element which would possibly cure the disease or prevent its development in recent cases.

Against this contention is the doubtfulness of the immunity and the progressive and chronic nature of the disease. Numerous experiments have been made in this direction, with, as usual, conflicting reports. There seems to be more reason to hope that the attempt will be successful to use the serum of immune mothers to cure their syphilitic children, or the serum of children, born without lesions, of syphilitic parents. Finally, Neumann reports some cases of his own in which various forms of serum treatment were tried. The serum of lamb's blood was absolutely without effect in one case. Five cases were injected with serum from two tertiary syphilitics. Of these, two were made worse and three apparently improved, but all returned in more or less time with secondary eruption. The only conclusion is that all definitive judgments should be delayed.

Experiments with Serum Therapy in Syphilis. (*La Semaine Médicale*, 1895, p. 181.) By A. Gilbert and L. Fournier, of Paris.

The serum of animals naturally immune to syphilis appears to have no effect upon the course of the disease, and the same is true of the serum of tertiary syphilitics (method of Pellizzari), probably, the authors believe, because the quantity of antitoxin contained in it is too slight. Nevertheless, an attempt was made with the serum of two cases in the tertiary stage. In the space of twenty days three hundred and four cubic centimetres were injected into a patient in whom the secondaries were pronounced. Considerable improvement occurred in the general condition, but at the end of this period the roseolar eruption had not completely disappeared. An attempt was made to produce artificial immunity in animals, and some were inoculated with the blood of recent syphilitics, some with excised chancres, and some by both methods. Seventeen patients were treated with the serum obtained from these animals, of whom seven received at the same time the ordinary specific treatment, and ten did not. All of the first class showed slight amelioration; of the second class, five showed no benefit, and five were more or less improved; in one of them, indeed, there was complete disappearance of all the symptoms. They conclude that the serum treatment causes improvement in the general condition, disappearance of the headache and pains in the bones and joints, and attenuation or even disappearance of the cutaneous and mucous lesions, but that these results are not constant and invariable.

The Healing Properties of Erysipelas in Syphilis. (*Centralblatt für innere Medizin*, February 1, 1896.) By Dr. Rudolph, of Magdeburg.

The author believes, as a result of the study of two cases, that erysipelas may exert a very favorable influence upon the course of syphilis, but he doubts if an actual cure often takes place. The first patient, a man of fifty-two years, had acquired syphilis at twenty-three years, and when he came under observation suffered from chronic ulcers of the nose and supra-orbital region; nine days after the commencement of the erysipelas the

ulcers were healed. The second patient was a dressmaker that had been infected at twenty-one years of age. Four courses of mercurial treatment and huge quantities of potassium iodide had been without effect, and the patient was extremely cachectic, her glands were enormously enlarged, she was disabled by syphilitic rheumatism, and had also paresis of the left side of the face with tic convulsif. Five years after infection she had a severe attack of facial erysipelas, and upon recovery all the syphilitic symptoms were found to have disappeared, and she was able to resume work. A year later her general condition was still good, but a submaxillary gland was enlarged and there was a gumma on the right tibia. In both cases the intercurrent erysipelas produced more effect than energetic antisiphilitic treatment.

Preliminary Report Concerning the Physiological Action of Extract of the Suprarenal Bodies. (*Wiener klinische Wochenschrift*, February 27, 1896.) By Arthur Biedl, M.D., of Vienna.

In mammals whose medulla oblongata had been cut and subsequently the entire spinal cord extirpated, it was possible to raise the blood-pressure from zero to from 90 to 160 millimetres of mercury by the injection of the extract of the suprarenal bodies; and this elevation could be maintained for some time by renewed injections. The curve of the blood-pressure, as traced upon a manometer, shows a rapid rise, and in case of a single injection, a sudden fall; but continuous injections maintain the pressure at a high point until cardiac paralysis ensues. As the medulla and entire spinal cord have been destroyed, the action of the extract must be peripheral, but whether it acts upon the terminations of the vascular nerves or the muscles themselves Biedl has not yet determined.

Aseptic Traumatic Fever. (*Comptes-Rendus hebdomadaires de la Société de Biologie*, March 13, 1896.) By L. Pillon, M.D., of Nancy.

In order to determine this question M. Pillon performed a number of experiments upon guinea-pigs and rabbits, causing various injuries, such as contusions, fractures, subcutaneous hemorrhages, etc. In each case bacteriological examinations were made of the blood and of the liquids from the site of the lesion; the temperatures were taken in the rectum. He arrives at the following conclusions: (1) Traumatisms, similar as to site and intensity, cause different degrees of hyperthermia, even in animals of the same species. (2) The result does not depend directly upon the extent of tissue destruction, nor (3) upon the amount of hemorrhage. (4) Of all injuries subcutaneous fractures give rise to fever most frequently. (5) Neither the age nor sex of the animal nor the nature of the fracture has an absolute influence upon the elevation of temperature. (6) Intra-peritoneal hemorrhage may give rise to a hyperthermia of 1° C. in twenty-four hours. (7) The following conditions seem to affect the genesis of the fever: (a) the absorptive power of the surrounding tissues; (b) the

nature of the effused liquids; (c) the degree of irritation of the injured tissues, the intensity of the local reaction, diapedesis, phagocytosis, etc. The author also reports two cases that came under his observation and that support his experimental work. The first was a man suffering from hæmarthrosis of the knee. The blood was carefully examined and found to be absolutely sterile, but contained a large number of leucocytes (1:6). The fever reached 39° C. The second patient had had his knee injured by a fragment of steel. Hydrarthrosis developed, and careful examination of the clear liquid by cover-glass preparations and culture were absolutely negative, although there were numerous leucocytes. The wound healed without reaction. The temperature exceeded 38° for several days, and then complete recovery ensued.

A Review of Polymyositis or Dermatomyositis Acuta. (*Centralblatt für Allgemeine Pathologie und pathologische Anatomie.*) By Richard Pfeiffer, M.D.

An examination of the literature reveals that very different symptom complexes are included in this term. Although the etiology is still unknown, it is nevertheless desirable to restrict the term as narrowly as possible, and the following symptoms are those that are most usually described. The disease begins suddenly or gradually and not infrequently with certain general symptoms, among which are headache, dizziness, weakness, and gastric disturbances. There is moderate irregular fever with a corresponding or increased frequency of the pulse and usually a splenic tumor. The important and characteristic local symptoms are the œdema and exanthemata of the skin in combination with the multiple inflammation of the muscles. The affected muscles are exquisitely painful, particularly at the attachment of the tendons. As far as may be determined by palpation, they contain foci of hard infiltration and areas of softening. At first the process begins in isolated groups of muscles, preferably in the extremities, and then, in its further extension, attacks the trunk. Usually the muscles of the eyes, heart, tongue, and the diaphragm are not involved, but in severe cases they may also be attacked. The lesions of the skin are manifest in copious sweating and the appearance of œdema and exanthemata. The latter occur in various forms (urticaria, erythema, roseolæ, herpes, and desquamative forms similar to psoriasis). According to Unverricht, it is characteristic, resembling urticaria, but differing by its obstinate persistence, whilst the deep red color more closely approaches that of purpura. It is located over the affected muscles, but not infrequently certain other parts are attacked, particularly the lower part of the abdomen. The œdema of the skin in association with the swelling of the muscles may cause complete deformity of the limbs (thick formless columns). The degree of involvement of the skin and muscles may be very unequal, one or other being less affected during the whole course of the disease; the inflammation of the muscles, indeed, may be so slight as to escape notice and only manifest

itself by the subsequent atrophy. That either should be exclusively involved, however, has not been observed. The nervous system is not affected: there are no disturbances of sensibility nor tenderness of the nerve-trunks. Stomatitis and inflammation of the throat may occur, but the joints are not involved, and the urine is free from albumin. The course is various, and complete recovery may occur after a brief or even a prolonged attack; in the latter case, however, atrophies of some of the muscles are apt to appear, with alteration of the electrical reactions. In very severe cases the muscles of respiration and deglutition are involved and death occurs by asphyxiation or lung-disease. This description applies to twelve recorded cases. A number of others have been reported that differ from this account in one or more particulars. Of the most interesting are the three cases of Lewry that occurred in the same family. The first was typical, the others had purpura as the chief symptom. The histological examinations seem to show that the disease is an interstitial myositis with secondary destruction of the fibres, but a few investigators (Leube-Rindfleisch) consider that the parenchymatous changes are primary. The cause is apparently some infectious principle. Pfeiffer believes the disease to be identical with the myositis gregarinosa of the lower animals, and Senator considers it to be an auto-intoxication from the alimentary tract. The differential diagnosis is most difficult from trichiniasis, and can only be made by a careful study of the history and the examination of the fæces or excised fragments. In neuromyositis differential symptoms are the tenderness of the nerve-trunks and disturbances of sensation. Less difficult are the polymyositis septica, syphilitica, and typhosa, and the polymyositis following alcoholic excesses or over-exertion. Pfeiffer concludes as follows: 1. The combination of lesions of the skin and inflammation of the muscles is not sufficient upon which to base a diagnosis. 2. The diagnosis is easy if the type as presented by Unverricht is accepted. 3. The existence of abortive and chronic forms requires further confirmation. 4. The cause is uncertain but an infectious agent is most likely. 5. Careful clinical, bacteriological, and histological studies are still necessary.

Early Diagnosis of Typhoid Fever by Bacteriological Examination of the Dejecta. (*Comptes-Rendus hebdomadaires de la Société de Biologie*, March 6, 1896.) By A. Chantemasse, M.D., of Paris.

A careful study of the different methods of discriminating between the bacillus coli and the bacillus of Eberth convinced the author that the method of Elsner is the most trustworthy. This consists in the employment of feebly nutritive media containing potassium iodide. The stools of two persons in good health, of a case of erysipelas, of two cases of la grippe, and of one case of pleurisy were examined by this method, with negative results. Three cases of typhoid fever were examined, once each, with like negative results, but there were certain unavoidable errors of technique. In thirteen cases of typhoid fever repeated examinations invari-

ably showed the presence of the bacillus of Eberth. By this means a positive diagnosis was made at the seventh day in eight cases, at the eighth, twelfth, and thirteenth days in one case each, at the seventeenth day in two cases, at the twentieth day in three cases, and at the nineteenth, twenty-first, twenty-third, and twenty-sixth days in one case each. In three of these cases the diagnosis would otherwise have been doubtful; thus, in one, after a brief febrile stage, only profound hysterical symptoms were present. The author contends that the typhoid infection is essentially benign, and that an early diagnosis is most important as regards the treatment. The analogy of typhoid to diphtheria led him to repeat, in connection with Widal, certain unsuccessful earlier experiments, and they succeeded in obtaining a virus of extreme power. With this virus they produced immunity in horses of the Pasteur Institute, and obtained a serum so powerful that one-fifth drop effectually protected a guinea-pig against a mortal dose of typhoid bacillus, but had no immunizing effect against the colon bacillus. Experiments upon healthy men having shown that this serum was innocuous, it was employed in three cases of typhoid fever, in all of which the bacillus of Eberth had been found in the stools. The injections were made at the twelfth, eighth, and ninth days of the disease, respectively, and in all three cases a steady fall of temperature occurred, such as occurs in abortive typhoid, until within a week, the temperature had become normal. Further communications are promised as soon as more extended experiments have been made.

A Case of Amœbic Dysentery and Liver Abscess. (*Wiener klinische Wochenschrift*, February 20, 1896.) By Franz Manner, M.D., of Vienna.

The patient had always lived in Vienna, and, at the time of admission, had suffered for a year from diarrhœa, with occasional bloody stools. He was much emaciated, and in the right hypogastrium there was increased resistance: this area was painful upon pressure, and a peritoneal rubbing could also be felt. The stools averaged eight *per diem*, and contained leucocytes, red blood-cells, epithelium, and some amœbæ. The temperature was high, with a morning remission. Five weeks after admission death occurred. A large abscess was found in the right lobe of the liver, filled with dark-brown pus containing amœbæ. The mucous membrane of the large intestine was swollen and injected, and interrupted by numerous ulcers, which in the rectum had begun to cicatrize. No amœbæ were found in the mucous membrane of the intestine, but they were numerous in the mucosa, excepting in the necrotic portions, even at some distance from the ulcers. In the muscularis a few were found in the neighborhood of deep ulcerations. The abscess in the liver consisted of numerous cavities, evidently of different periods. The oldest cavity was encapsulated; in necrotic parts non-nucleated oval bodies were found, about the size of amœbæ. In the necrotic areas, in the walls of more recent lesions, amœbæ were found in great numbers. A cat that had been injected with several cubic centimetres

of the fæcal discharge had bloody stools and died in a week. The mucous membrane of the large intestine was full of ulcers, and in their necrotic bases numerous living amœbæ were found. Amœbæ were also found in the intestinal glands, and occasionally they had broken through the glandular epithelium and lay in the surrounding tissue.

The unusual features of this carefully-studied case, to which Manner calls attention, are: the occurrence of amœbic dysentery in a native of Vienna, and the long course of the disease, death occurring finally as a result of the intercurrent hepatic abscess.

Parasitic Ictero-Hæmaturia of the Sheep; a Contribution to the Study of the Amœba Sporidium. (*Virchow's Archiv*, vol. cxxxix., No. 1.) By Professor A. Bonome, of Padua.

The clinical symptoms of the disease are weakness, refusal of food, fever, icterus, hæmaturia, and sometimes œdema of the neck. The gross lesions are parenchymatous degeneration and icteric discoloration of the organs. Microscopical examination of the blood from the living animals showed paleness of the red blood-cells and poikilocytosis. In the plasma and in many of the corpuscles were numerous small bodies that were actively contractile, and occasionally the intracellular forms left the cell. Their number was always proportional to the severity of the disease, but not to the degree of fever. When cover-glass preparations had been fixed by the vapor of osmic acid and heat, the basic aniline colors stained the organisms intensely, and often several were found in one cell. Microscopic examination of the liver, spleen, kidneys, and bone marrow revealed numerous organisms, many of them being in a stage of division; and this was found to be of the endogenous type, the organism splitting up into four, six, or eight small bodies that were contractile and did not contain pigment. Structurally, the parasite consists of a safranophile body in the centre, surrounded by a cyanophile (methylene-blue) substance. The histological changes in the liver consisted of an advanced cellular necrobiosis. A bacteriological examination of the blood and organs of a diseased animal was entirely negative, as were also the inoculation experiments,—the blood from a diseased animal in the acute stage being injected into a young sheep, a rabbit, and a guinea-pig.

Bonome believes that the organism enters with the food, and that it belongs to the group of amœbæ, despite the fact that he could find neither pseudopodia nor cilia, and he therefore proposes to call it the amœba sporidium polyphagium of sheep's hæmaturia.

Tuberculosis in Valvular Lesions of the Heart. (*Wiener klinische Wochenschrift*, February 20 and 27, 1896.) By A. R. v. Weismayr, M.D., of Vienna.

Rokitansky's celebrated principle that "venous congestion and cyanosis give rise to an eminent immunity against tuberculosis" is carefully com-

pared with the reported literature; and, although it is usually confirmed, nevertheless the two conditions are found to be not absolutely mutually exclusive. Thus Frommold found twenty-one cases of tuberculosis among two hundred and seventy-six cases of valvular disease, and v. Kryger, in eleven hundred autopsies of tuberculous patients, found ten cases of valvular heart-disease; and he found, also, fifty-nine cases of cured tuberculosis in the autopsies of cases of valvular heart-disease. Weismayr himself found six cases in the service of Professor Schrötter, which he reports as follows:

CASE I.—A woman, thirty-seven years of age, and eight months pregnant, had had fever and cough for five months. Tubercle bacilli were found. The physical examination revealed, in addition to the pulmonary condition, a mitral regurgitation. Two weeks after parturition death occurred, and the autopsy showed a recent and an obsolete endocarditis that had caused a double lesion at the mitral orifice, and a chronic infiltrating tuberculosis, with cavity formation in the left apex.

CASE II.—A man, thirty-five years of age. Seven years previously, after an attack of articular rheumatism, he had had palpitation of the heart and œdema of the extremities; a few months prior to admission cough and fever had occurred. The physical examination showed cold abscess over the sternum, mitral and aortic insufficiency; no bacilli were found. Subsequently tuberculosis of the epididymis developed.

CASE III.—Man, nineteen years of age; he had had rheumatism at twelve years, and later an old valvular lesion had been diagnosed. Cough had commenced about a year before admission. The diagnosis was double lesion of the mitral orifice and tuberculosis of the right lung. Tubercle bacilli were found.

CASE IV.—Woman, fifty years of age. Three years before admission palpitation had commenced. The clinical diagnosis was aortic insufficiency. The autopsy confirmed this, and showed, in addition, chronic tuberculosis of both lungs.

CASE V.—Man, sixty-four years of age. Six months previously he had been treated for lancinating pains in the breast. The clinical diagnosis was mitral and aortic insufficiency and infiltrating tuberculosis. The bacilli were found in abundance.

CASE VI.—Man, forty years of age. About six months ago his sickness had commenced with gastric disturbance; since then he has grown worse. The clinical diagnosis was insufficiency of the aortic valve, pulmonary tuberculosis, and chronic nephritis. The autopsy showed an obsolete endocarditis, with retraction of the aortic valves, chronic tuberculosis, and caseous peribronchitis; universal œdema.

Of these six cases three were confirmed by autopsy, and in the others the cardiac lesion was undoubted, as there were diastolic and systolic murmurs, and increase of the area of cardiac dulness. In Cases III. and V. tubercle bacilli were also found; in Case II. they failed, but the physical

signs were characteristic. In four of these cases the cardiac lesion certainly preceded the development of the tuberculosis; in Case IV. the tuberculosis was chronic, and had produced no symptoms; in Case V. it could not be ascertained when the heart lesion had commenced. Classified according to the valvular lesions, there occurred two cases, each of double lesion at the mitral orifice, of combined insufficiency of the mitral and aortic valves, and of aortic insufficiency. In three of the cases the course of the tuberculosis was decidedly chronic; in the others it was rapid.

Weismayr concludes, like a loyal Viennese, that the old principle of Rokitsansky still holds good. He urges that six cases in the large service of Professor Schrötter is an infinitesimal proportion, and the fact that, in three of these, the tuberculous process was essentially chronic, shows that hyperæmia of the bronchial mucous membrane is unfavorable to the growth of the bacilli. From such a small number of cases it is impossible to dogmatize; but it seems to be indifferent whether the aortic or mitral orifices are affected, whilst involvement of both seems to exert a more retarding influence.

The Phonendoscope of Dr. Bianchi. (*Comptes-Rendus hebdomadaires de la Société de Biologie*, March 6, 1896.) By Ch. Compté, of Paris.

The phonendoscope is an instrument designed to permit the combined use of percussion and auscultation. It consists of a shallow metal cup, covered by a thin disk of ebonite, with a perforation in the bottom of the cup, to which is attached a bifurcate tube furnished with two long rubber tubes for the ears. From the centre of the disk of ebonite, or better, from a second disk that covers and protects it, arises a little rod, five or six centimetres long, with a button at the end. In use this button is placed over the organ to be explored, and from the point of application towards the periphery the finger is rubbed on the skin. Whilst still within the limits of the organ the bruit is loud and distinct, but the moment that the limit is passed it diminishes markedly in intensity. Not only is it possible to outline an organ by this method, but Dr. Bianchi contends that it is even possible, with practice, to recognize the different cavities of the heart and the position of the septum, and of the interlobular fissures of the lung. The change in the sound is so pronounced that even persons whose hearing is not very acute may outline accurately.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

Thyro-iodine. (*Zeitschrift für physiologische Chemie*, vol. xxi., 319.)
By Professor Baumann, of Freiburg.

Chemical investigation of the thyroid gland, in conjunction with clinical trial of the product by Dr. Roos, has led to the important result of obtaining from the thyroid glands of sheep a product amounting to from 0.2 to 0.5 per cent., which possesses, in a high degree, the peculiar therapeutic activity of the gland, and which is almost as powerful as a corresponding quantity of the fresh gland. One of the most remarkable characters of this constituent of thyroid gland is that it is an iodine compound. According to the account given by Baumann, thyro-iodine is described as an amorphous brown powder, almost insoluble in water, and readily soluble in alcohol. It is readily dissolved by alkalies, and is again precipitated on adding an acid. When heated it swells up and gives off an odor of pyridine. Thyro-iodine does not give any of the reactions of albumin; it always contains phosphoric acid corresponding to 0.4 to 0.5 per cent. of phosphorus, and, possibly, it may be a product derived from the nuclein acids of Kassel. By repeated purification a product has been obtained containing no less than 9.3 per cent. of iodine, but the proportion of phosphorus was not equally increased. Examination of the human thyroid gland showed that it contains a similar iodine compound in the normal condition, whereas in cases of goitre, the amount of iodine appeared to be smaller. The discovery of this organic iodine compound appears to throw a light upon the use of iodine in the treatment of affections of the thyroid gland, and it offers an explanation of the fact observed by Kocher, that preparations of thyroid gland are much more rapidly effective than saline compounds of iodine. It is suggested that this difference is analogous to that observed in the assimilation of iron when administered in the form of organic compounds and in organic salts, etc. (*Pharmaceutical Journal*, February 29, 1896.)

The Treatment of Hysterical Anorexia by Hypodermic Injections of Morphine. (*Le Progrès Médical*, February 22, 1896.) By S. Dubois, M.D., of Saujon.

Sometimes hysterical anorexia resists all treatment and results in death. In such cases the patients become extremely emaciated, they present a dry, wrinkled, cold skin, a small, rapid pulse, and a dry, sooty tongue. Such patients may receive hydrotherapy, isolation, hypnotic suggestion, gavage, and intra- and extrastomachal electrization without result. The author had three cases of this description, and, after conscientiously employing the

methods of treatment detailed above, and when consultants agreed with him in a fatal prognosis, he began to treat the patients by the hypodermic injection of morphine. At first he injected three centigrammes (about one-half grain) of morphine at four-hour intervals, until three doses had been given, or until he had produced paralysis of the stomach wall; in two cases three doses accomplished this result. He tells the patient that she will become numb, that her pains will diminish, and he assures her that she will be able to take and retain the food that will be given to her a half hour after the injection. He insists upon two points in this method of treatment: first, that the injections be given at the same hour each day, and that they be followed in a half hour by the administration of food, either with gavage or without gavage; second, that the patient be assured that the food will be retained, and that it will not give rise to pain. The only patients which one is authorized to treat by this method are those who have arrived at such a state of organic debility that hypnotic suggestion, while possible, is not lasting in effect. After having used morphine in the manner indicated, these patients become hypnotizable and suggestionable in a few days. If such patients are finally cured, it is not from the medicinal action of morphine, but from the influence of psychical treatment, which was insufficient and ineffectual before the use of the hypodermic injections. The diminution of the dose of morphine should be made progressively as soon as alimentation and assimilation have been sufficient to augment the body weight. If the treatment is well directed and if psychical treatment is thoroughly carried out, a cure of these stubborn anorexias ought to be made in less than three months.

[This treatment has always the danger of producing morphomania in the patients on whom it is used. Carefully followed out, as indicated by Dr. Dubois, this danger is at its minimum. The weak point in the treatment is that there will be a great temptation to use it before other means have been thoroughly tried, and in the hands of men of loose methods it would be productive of infinite harm. It is not, therefore, a method to be advised indiscriminately.]

Concerning Applications of Picric Acid to the Therapeusis of Burns. (*Gazette des Hôpitaux*, January 18, 1896.) By Dr. Thiéry.

The author sums up the advantages of treating burns with picric acid applications as follows: Picric acid is a local remedy which is analgesic, antiseptic, and ceratoplastic. It presents no danger of explosion; it is odorless; it is neither caustic nor toxic, and it may be used in cases of burns occurring in children. Its saturated solution is easy to prepare without weighing, since the operation can be finished by decantation; it never alters. A very small volume of crystallized picric acid represents a considerable quantity of solution. The cost is the lowest. In military surgery picric acid is applicable to many other conditions. The dressing is very simple to apply. It is a thin dressing. Cure is effected in a con-

dition of analgesia and with a rapidity scarcely customary. The cicatrix is small. One inconvenience is that the dressing discolours the hands and the clothing, but linen ought to be easily decolorized, and the first inconvenience may be overcome, thanks to certain precautions in the technique.

In applying the dressing of picric acid it is necessary to thoroughly clean off any greasy dressing, such as carron oil, that may have been applied. The remedy may be applied in one of two ways: first, by immersion in a picric acid bath; and second, by compresses wrung out of the solution. The immersion in a cold or tepid solution ought to last from five to ten minutes, and is only practicable in cases of burns of the first segment of the extremities. After the bath, the limb should be covered with dry cotton if all the epidermis is preserved; if the epidermis is destroyed a light layer of sterilized gauze will keep the cotton from adhering. This dressing may be renewed at the end of three or four days. In applying compresses wrung out of the solution it is necessary to cover them with dry cotton; because, in order to derive the greatest benefit, the dressing should be dry. Layers of rubber cloth placed between the cotton and the compress will give poor results. In order that the cure be as rapid as possible the dressing should be applied at the moment when the accident is received and the burn should not have been previously treated.

I. A Trial of Thyroid in a Few Cases of Insanity. By Ales Hedlicka, M.D. II. On the Use of Thyroid Extracts in Mental Disease. By Warren L. Babcock, M.D. III. Thyroid Feeding in the Insane. By Willard Hospital Medical Staff. (*State Hospitals Bulletin*, January, 1896.)

I. The use of thyroids in the various forms of mental derangement has been made the subject of special investigation in three of the New York State hospitals for the insane, and the results, to date, are published in the *Bulletin*. In the Middletown State Hospital (homœopathic), Dr. Hedlicka (I.) has used thyroid tablets in four cases of general paresis, one case of suicidal melancholia, one of primary dementia, one of dementia following acute melancholia, one of puerperal insanity, one of paranoia, and three of secondary dementia. All these patients were free from respiratory or circulatory disorder. The treatment extended over two months, and was begun with the administration of five grains daily, and was gradually augmented to twenty-five or thirty grains daily. Among the effects of the drug the following are recorded: Both the pulse and respiration increased in frequency, but this increase was never extensive. There was an increase in temperature of one or two degrees. The appetite improved. The bowels were regulated, and in several cases diarrhœa was produced. The elimination of urea was increased. The majority of patients lost weight while under treatment. Regarding the mental symptoms there was noted, under moderate dosage, pronounced general psychical improvement, the mind became clearer, more active, and the manner livelier. Sleep was improved. When

the dose surpassed the moderate mark, as a rule, symptoms of irritation appeared. While under treatment, one of the cases developed a left brachial monoplegia, without apparent cause, which disappeared without special treatment. The case of puerperal insanity was cured. The case of suicidal melancholia, that of dementia following melancholia, and two of the cases of secondary dementia were temporarily improved. The case of primary dementia grew worse. In the cases of general paresis but few temporary ameliorations were noticed. The author considers the remedy more as an alterative of great value than as a curative drug.

II. Dr. Babcock experimented with desiccated thyroids at the St. Lawrence State Hospital with three main objects in view: first, to definitely ascertain the physiological action of thyroid; second, to determine thereby in just what classes of cases it might be used to further recovery; third, to apply it therapeutically to those cases in which it offers the best results. This observer determined that extracts made from the thyroid gland have a definite physiological action; that an unvarying strength of any given amount can be obtained by proper preparation; and that the true thyroid preparations have no relationship with the so-called animal extracts. The treatment was begun by the administration of five grains of desiccated thyroid extract, and this dose was increased judiciously. Fifteen grains seemed to be the maximum dose that could be given with safety for any length of time, and then only in patients whose physical health was impaired in a slight degree if at all. The physiological action of the drug may be summed up as follows: The number of red blood-corpuscles per cubic millimetre and the percentage of hæmoglobin were increased. In the majority of cases arterial tension was increased, in a small proportion the blood-pressure was diminished. Precordial oppression occurred in a few cases. The pulse was accelerated, the respirations were not especially influenced. The temperature in the majority of cases was elevated from one to three degrees. In one case the temperature was subnormal. Myasthenia was pronounced in the majority of cases at an early period of treatment; flaccidity, tremor, and general weakness characterized these cases. The early development of a feeling of apprehension, together with some mental and much motor restlessness, was noted, usually during the third day. At first there was an apparent sense of fatigue with great mental oppression, followed by a gradual clearing up of the cerebral processes and improved mental co-ordination. The reflexes, in the majority of cases, were increased and exaggerated from an early period of the treatment. In nine cases presenting more or less anæsthesia, the sensibility returned to normal or was very much improved. Two cases became hyperæsthetic. Diuresis was well marked in many cases, and perspiration was decreased. A few of the cases presented varying degrees of gastric symptoms. Urticariiform eruption accompanied by severe itching, followed by scaling and desquamation, was observed in two cases. The elimination of the products of retrograde metamorphosis was greatly increased. Thyroid holds out prospect of recovery

or improvement, first, in cases of post-melancholic hebetude following a lengthy period of depression; second, in cases of stuporous melancholia of long duration; third, in maniacal cases whose attacks have been unduly prolonged; fourth, in cases of cerebral exhaustion following acute delirium or stupor in which the elimination of urea and other nitrogenous compounds is greatly reduced; fifth, in chronic disturbed cases; sixth, in doubtful cases thyroid may assist in differentiating between true stupor and dementia; in delusional cases it will show whether the delusions are fixed or temporary.

III. The medical staff of the Willard State Hospital have been using thyroids in a variety of mental disorders, with results corresponding to those already indicated in the foregoing papers.

The Treatment of Hyperpyrexia in Children, with Some Illustrative Cases. (*Medical Record*, February 22, 1896.) By Louis Fischer, M.D., of New York.

In the treatment of hyperpyrexia in children, the author, after enumerating the dangers of the antipyretics now in use, recommends a new antipyretic and analgesic, apolysine. Apolysine is not poisonous. It is split up in the human organism into para-amido-phenol and para-phenetidin, ethyl, and citric acid, which, as is well known, are oxidized into carbonic acid and water. Para-amido-phenol and para-phenetidin,—*i.e.*, the group in which one hydrogen atom of the amides (N_2H_2) is substituted by citric acid, produces lower temperature, whereas the ethyl has the analgesic action. The substances are found in the urine either as glycerose combinations or as sulphate salts, which can be proved by chemical examination. Five grains of apolysine may be given to a child of one year and repeated every two or three hours, the intervals depending on the urgency for reduction of hyperpyrexia. If there is no distinct effect noticeable from the five-grain dose after three doses, it is perfectly safe to give doses of ten grains each, every two hours, until the fever has been reduced. Apolysine is applicable for the reduction of high temperatures in any and all affections in which antipyretics are required. The drug may be given by the rectum.

It has been used with good results and without the production of subnormal temperature for the control of hyperpyrexia accompanying influenza, measles, pneumonia, acute gastritis, rheumatism, and typhoid fever.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D.,

AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the University of Pennsylvania,

Medical Superintendent of the Presbyterian Hospital.

The Radical Treatment of Hernia and its Present Status. (*St. Petersburger medicinische Wochenschrift*, No. 50, 1895.) By Wilhelm GRIEFFENHAGEN, M.D.

The number and variety of operations now practised for the radical cure of hernia are evidence of the fact that no operation is ideal, at least for every case and every operator. The newer methods seem, however, to produce better results, so that the mortality by non-incarcerated herniæ, which are not complicated by a resection of the mesentery or intestine, has diminished from 11.5 per cent. in 1887 to nothing at the present day, numerous operators reporting long series of cases without a single death. The radical operation for non-incarcerated herniæ may, therefore, the author believes, be said to be a harmless operation.

But this is not all that is to be desired. What are the final results, especially in inguinal hernia? In 1874 the percentage of recurrence varied between thirty and forty per cent., to-day it is from ten per cent. to nothing, the best statistics being shown to follow the Macewen and Kocher methods. That is, we may say, that allowing for the short time some of these cases have been under observation, the results, so far as permanent cures are concerned, are nearly all that could be desired, and the two chief objects of the operation are assured,—it is harmless and it produces a radical cure.

This is the present status of the operation, and its influence is felt in the change which it has made in the indications for the operation. Unquestionably, all herniæ that cannot be replaced, or are held up with difficulty, should be operated upon if they have ever shown even a slight tendency to strangulation.

The radical operation is further indicated,—

1. In every free hernia in which the truss is not sufficient or only holds up the hernia with difficulty and is a burden to the patient.
2. In middle-aged and young persons of the laboring classes, who cannot afford to buy and renew good trusses as often as needed.
3. According to the latest statistics hernia in children should always be operated upon, especially when the herniæ are large.
4. The wish of the patient to be operated upon, in order to be rid of a truss, is sufficient ground for operating, and patients should be told that the operation is harmless and will produce a lasting result.

Contra-indications are herniæ so large that the abdomen will not contain the contents, and any disease of the system that precludes all operations.

The best results are obtained in small, free, and recent herniæ. Early operation is therefore the best for the patient. The more adhesions that have formed between the hernial sac and the tissues, the greater will be the technical difficulty in operating.

The various methods are applicable to the different forms of herniæ; the author uses Macewen's and Kocher's by preference.

The Treatment of the Wandering Spleen by Splenorrhaphy. (*Archiv für klinische Chirurgie*, No. 3, 1895.) By W. Lykoff, M.D.

The author, after studying with great care the existing literature concerning the function of the spleen as a blood-producing and blood-purifying organ, shows that the progress and development of our knowledge in this direction is limiting the field in which splenectomy is allowable, and that the present indications are for the preservation of the spleen so far as is possible, and, at least, by means of other operations, as splenorrhaphy and splenotomy, to avoid the results which come to the organism from the loss of the important functional power of this organ.

The author summarizes the results of his experiments in methods of fixation of the spleen as follows:

1. By the employment of a catgut net it is possible to fix the spleen firmly and certainly to the abdominal wall.

2. It is sufficient to fix the middle half of the organ.

3. The contraction of the newly-formed tissue contracts the spleen somewhat.

4. The function is not altered.

5. The catgut threads play the principal rôle in the fixation, for, in place of them, connective-tissue fibres form.

6. Any form of irritation or scarification of the surface of the spleen is harmful, as it does not materially increase the amount of fixation, and makes suppurating more easy if the catgut has not been carefully sterilized.

In regard to the physiological function of the spleen, his experiments lead him to make the following *résumé*:

1. In order that the extirpation of the spleen may be followed by favorable results, it is necessary that the other blood-making organs should be in perfect functional activity.

2. In the place of splenectomy, in cases of local lesion, splenotomy with partial resection should be employed. This is made possible by the employment of steam to check hemorrhage.

3. Splenectomy is indicated when the spleen is the seat of a primary and not secondary growth, which threatens to involve the entire system, and in cases where the pathological change is so great that the hope of a return of function cannot be entertained.

4. The floating spleen can and must be fixed.

5. The spleen held in the catgut net has all its normal functions.
6. It decreases the size of the spleen, a fact that is of value in cases of hypertrophy.
7. The prolapsed spleen should be replaced and fixed in position, if possible.

The Treatment of Angeiocholitis and Cholecystitis of Infectious Origin. (*Revue de Chirurgie*, December, 1895.) By Felix Terrier, M.D.

After a critical discussion of the different modes of treatment employed for these conditions, and a careful study of the best methods of procedure, the author summarizes his views in regard to their treatment as follows:

1. Where the biliary ducts are the seat of an inflammation which produces intense febrile symptoms, either with or without the presence of calculi, which are continuous or subject to exacerbations, there is an absolute indication for surgical intervention by laparotomy.

2. This laparotomy should have for its object the opening of the gall-bladder and the permanent establishment of a biliary fistula,—that is, it should be a cholecystotomy.

3. The results produced by this operation are: a clear understanding of the condition present in the accessory bile-ducts (the cystic and vesicular); the principal bile-duct (*ductus choledochus*) can be explored; free exit is given to the septic bile contained in the bile-ducts and infecting from thence the entire system.

4. This free exit for the septic bile produces, in a certain indirect and mechanical manner, the disinfection of the bile-ducts, and one that is much better than those employed in purely medicinal methods of treatment.

Catgut Sterilization by a New Process. (*Berliner klinische Wochenschrift*, January 13, 1896.) By E. Saul, M.D., of Berlin.

The superiority of catgut as a suture and ligature material, which it possesses on account of its absorbable nature, led the author to study experimentally to find a process by which it could be rapidly and certainly rendered sterile without destroying any of its valuable characteristics.

Basing his research upon the work of Répin and others, he studied the effect of boiling alcohol in different concentrations and with the admixture of other ingredients, desiring to lower the boiling-point and shorten the time required for complete and certain sterilization. After testing various mixtures he finally determined, by exhaustive experiment, that the following mixture produces the most certain results in the minimum amount of time.

Alcohol (ethyl alcohol), 85 parts; acid carbol. liquefact., 5 parts; aqua destillata, 10 parts.

An apparatus is requisite which maintains the solution in its original concentration and prevents excessive pressure, while keeping the boiling-point at the same degree of temperature.

Catgut, when boiled in this solution for fifteen minutes, is absolutely

sterile and its quality is uninjured, while experiment has shown that five minutes' boiling is sufficient to destroy the spores of anthrax. The catgut may be used immediately after sterilization.

The Surgical Treatment of Cancer of the Stomach. (*Revue de Chirurgie*, No. 10, 1895.) By Professor Quénu, M.D., of Paris.

The author reports two very interesting cases, which amply justify, by their results, the surgical interference proposed. In one case, after pylorotomy and gastro-enterostomy, the patient was relieved from all symptoms and regained health and strength, but died one year later after a recurrence. In the other, a gastro-enterostomy relieved the patient's symptoms and produced a marked amelioration in the general condition. He believes that the presence of a suspicious induration in the gastric region, accompanied by dyspeptic symptoms, justifies an exploratory incision.

The fact is again noted that these cases are generally brought to the surgeon too late for permanent relief.

The following are the rules which guide him in these cases. Make an exploratory laparotomy, find out the exact location and character of the growth, and then judge whether interference is justifiable or not.

1. If the cancer of the pylorus is non-operable, is too diffuse, has involved too many lymphatics, or is too adherent, perform, as a palliative measure, a gastro-enterostomy.

2. If the cancer is operable, perform a gastro-enterostomy, and then, eight or ten days later, resect the pylorus and remove the tumor.

This method of procedure, the author believes, has the following chief advantages: the secondary pylorotomy can be done more rapidly, while the gastro-enterostomy permits the building up of the patient before the more serious operation.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

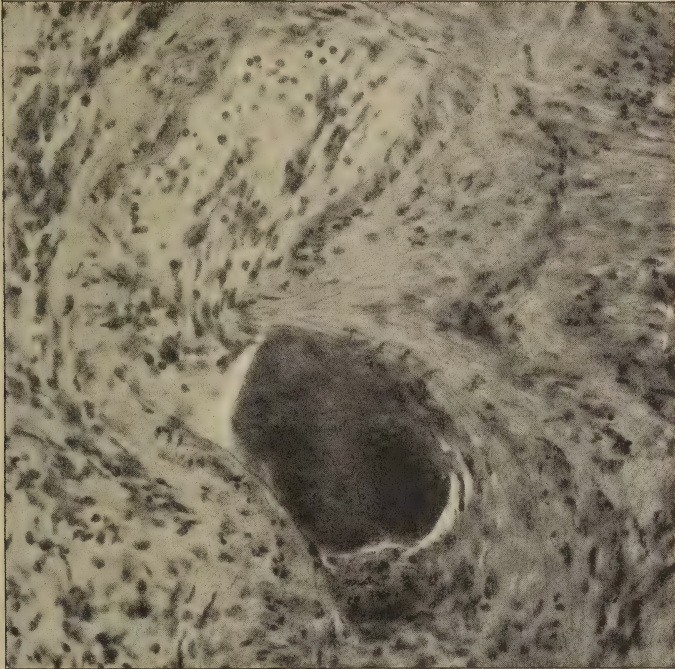
EDMUND LANDOLT, M.D.,
Paris, France.

A Contribution to the Pathology of Embolism of the Central Artery of the Retina. (*New York Eye and Ear Infirmary Reports*, vol. iii. part 1.) By Wilbur B. Marple, M.D.

The accompanying phototypes are so instructive, and cases of this character are so seldom examined microscopically, that a detailed account of both the clinical symptoms and the pathological changes here found has been deemed of sufficient importance to present in full.

The patient, a fifty-two-year-old Jewess, suddenly lost the vision of the left eye in September of 1893. Two days later, Gruening, of New York, found the characteristic ophthalmoscopic appearances of embolism. At this time vision was reduced to mere perception of light. In seven weeks' time she returned with the statement that she had been bedridden with articular rheumatism during the intervening period, and that three or

FIG. 1.



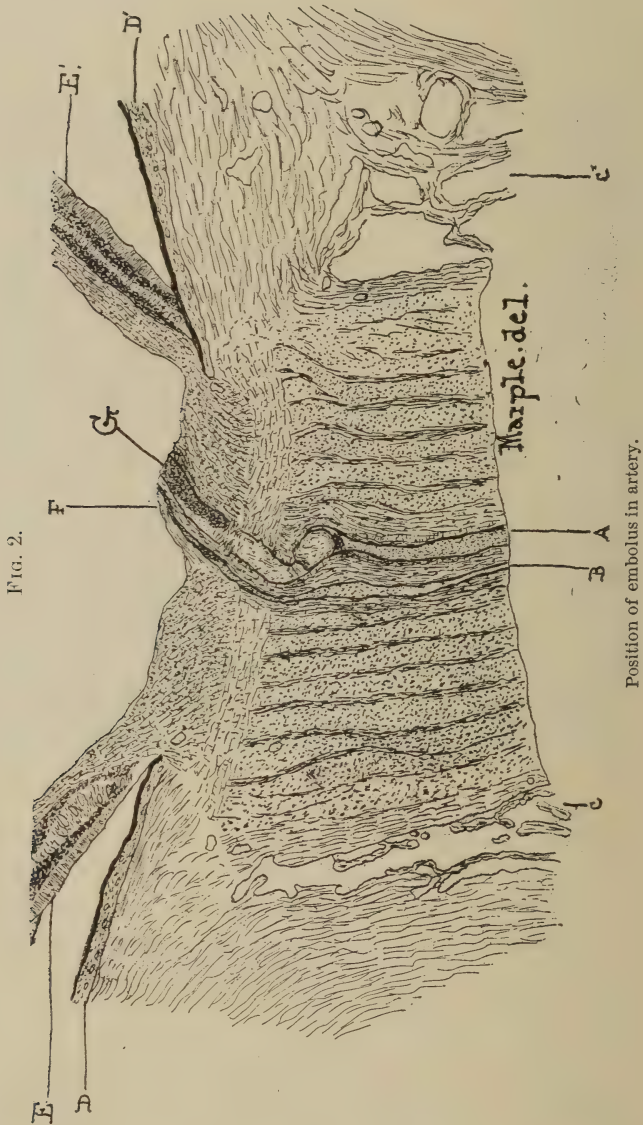
Appearance of embolus.

four weeks before this visit her bad eye had become persistently painful. At the time of the second examination there were all the evidences of an acute and excruciatingly painful attack of secondary glaucoma. The eye had become absolutely blind. As physical examination revealed a serious cardiac lesion, and as the kidneys were found to be affected, cocaine was used as a local anæsthetic, and the eyeball was removed.

The eyeball was hardened in Müller's fluid, placed in alcohol, and mounted in photoxyline. The optic nerve was cut off close to the globe, and mounted separately. The globe was divided by a horizontal section made just above the nerve, and sections were so arranged as to pass through the nerve.

Macroscopical examination showed that the antero-posterior diameter of the globe was twenty-four millimetres; the vertical diameter being one-half a millimetre less, and the transverse diameter one-half a millimetre more. The vitreous was coagulated. The depth of the anterior chamber

was fourteen and one-half millimetres, and the pupillary width equalled three and one-half millimetres. The intervaginal space of the optic nerve was considerably dilated. Forty or fifty complete meridional sections, passing through the nerve entrance, were secured and arranged in series for



examination. They were stained in eosin and hæmatoxyline. Two or three of the sections passing through the middle of the nerve showed the appearance of an embolus immediately back of the lamina cribrosa. The plug itself measured one-seventh of a millimetre in length and one-ninth of a millimetre in diameter (see Fig. 1). The embolus was apparently

hyaline in character, and showed but little structure. It was stained with hæmotoxyline. As shown in Fig. 2, the plug had been caught just in advance of a sharp bend in the vessel as the vessel ascended to the papilla. In this position the lumen of the vessel was reduced to hardly more than one-half of what it was in front and behind this point. At the seat of the embolus the vessel was completely occluded. Almost filling the vessel as it ascended on to the papilla there was a mass of red blood-cells. Back of the embolus there was a well-organized thrombus which almost completely filled the vessel (see Fig. 3.) The intima of the vessel was hyper-

FIG. 3.



Section of arteria centralis retinae back of embolus, showing the organized thrombus. A, muscularis; B, intima; C, organized thrombus.

trophied and showed much increase of nuclei. The papilla itself, which was one and one-half millimetres in diameter, was, if at all, excavated to but a trifling extent. There was a marked increase of nuclei throughout its tissue.

Transverse section of the optic nerve showed a condition of pronounced interstitial inflammation. There were not any marked vascular changes except as above noted. As stained with Weigert's hæmotoxyline, the nerve was found to be entirely atrophied and none of the fibres remained darkly stained.

In the retina there were no apparent changes in the pigment epithelium. The rods and cones were apparently normal, the principal changes were found in the inner layers. The ganglion cells had disappeared, leaving but a few nuclei remaining. The fibre layer did not show any fibrillation except near the papilla, and for some distance on each side of the papilla the fibre layer was thickly infiltrated with cells. At this portion the retina was markedly œdematous, showing numerous varicosities, at which places the membrana limitans interna was elevated. (See Fig. 4.)

The iris was atrophied, and the iris angle was closed.

By careful search through the literature of the subject the author has found that fourteen cases previous to the one that he has detailed have been described. In four of these no plug of any sort could be found.

FIG. 4.



SECTION OF RETINA.—*a*, layer of rods and cones; *b*, external granular layer; *c*, outer reticular layer; *d*, inner granular layer; *e*, layer of ganglion cells (no ganglion cells left); *f*, nerve-fibre layer. The ganglion cells have almost entirely disappeared, a few nuclei only being present. There is marked retinal œdema, especially in layer of nerve-fibres.

Of the remaining ten, in five it was not possible to assert whether the occluding mass was an embolus or a thrombus, thus leaving but five cases in which an unmistakable embolus was found. In two of these five cases it was found only in cross section of the nerves, but not in a longitudinal section of the vessel. In regard to the difficulty in securing a section passing along the axis of the vessel the writer was fortunate enough to have everything work successfully; the knife was sharp, the embedding mass was of the proper consistence,—so that beginning at one side of the nerve he secured about seventy-five complete sections before he reached the opposite side without losing or mutilating a single one; and out of all these but two passed along the axis of the vessel, showing the embolus in position.

For many reasons the writer believes that the present case is exceptionally interesting and instructive. In the first place the embolus was found, this being the first case in America in which this has been done. Again, this case is one of the four that have been studied in eyes that have been enucleated during life, and but one other case was enucleated so early after the occurrence of the embolism; the early cases being valuable as showing the early destruction of the ganglion-cells and nerve-fibres of the retina, as well as the degeneration of the optic nerve.

A New Operation for Congenital Ptosis, with Report of Two Cases. (*New York Medical Journal*, December 21, 1895.)

T. C. Evans, of Louisville, Kentucky, reports two instances of the hereditary type of the affection in brothers whose father and grandfather were afflicted in the same manner. To use his own words he says,—

“I found both patients bad subjects for plastic surgery, on account of an apparent predisposition to eczema. In spite of every precaution the skin around the edges of the wounds would become eczematous, and later the stitches would suppurate, which, of course, loosened the flap and destroyed the effect of the operation and left some cicatrices which are still

plainly apparent. While some improvement followed the operation of Panas's method, as must necessarily be the case in any procedure that would produce vertical cicatrices of the superior lid, the result was so far from satisfactory that I decided to operate a second time by a new method, or, more correctly speaking, by a radical modification of Mules's method. With the patient anæsthetized, I made an incision three-eighths of an inch long in the free margin of the lid and about a sixteenth of an inch in depth, the site of the incision being midway between the outer and inner canthus. I then made a second incision three-fourths of an inch in length above the brow, extending through the integument and occipito-frontalis muscle (the most prominent part of the occipito-frontalis having been determined and marked prior to the anæsthesia). Then, taking a flat needle having a long, flexible shank with the eye very near the point (Fig. 1), carrying about six inches of No.

FIG. 1.



30 silver wire, I passed it into the lid at the inner extremity of the marginal incision, passing upward between the orbicularis muscle and the tarsus, under the brow, and coming out at the inner extremity of the incision above the brow. The needle was withdrawn, leaving the wire in position; the other end of the wire was passed through the eye of the needle and carried into the outer extremity of the marginal incision and brought out at the outer extremity of the superior incision, and the needle was withdrawn as in the first instance. The loop of wire was drawn into the marginal incision, and the wound was closed with four or five firm sutures. The ends of the wire were then passed through a perforated (No. 1) shot and traction made until the desired elevation of the lid was secured. The shot was then pressed with pliers and the excess of wire clipped off, tearing a quarter of an inch on each side of the shot. The incision was closed with silk sutures. Afterwards the superior incisions were dressed with iodoform gauze; the marginal incisions were left without dressing. Both eyes of each patient were operated upon under one anæsthesia. The sutures were removed from both superior and marginal incisions forty-eight hours after operation. The results in the four operations have all been successful far beyond my expectations, as can be seen from the photographs taken before and after the operation.

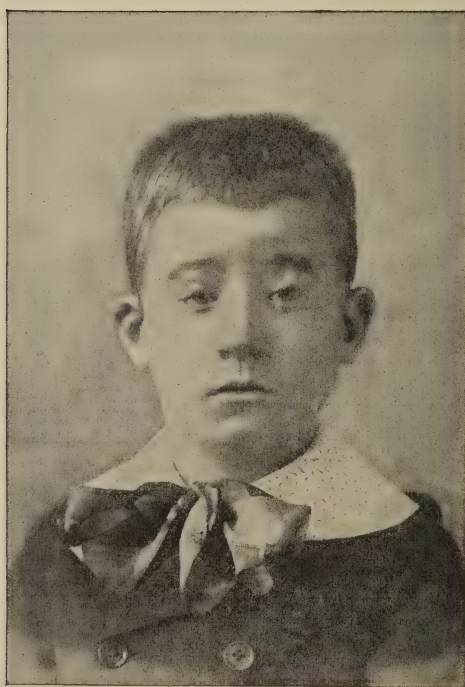
"The points of superiority of the operation as devised are that the incisions make it possible to bury the wire from the start without waiting for it to 'sink below the skin' of its own accord. With the incisions the recovery from the operation is practically complete in forty-eight hours. The introduction of the needle at the lid margin instead of above the brow removes the possible danger of passing through the lid and puncturing the sclera, and secures a better position for the suture. With the perforated

FIG. 2.



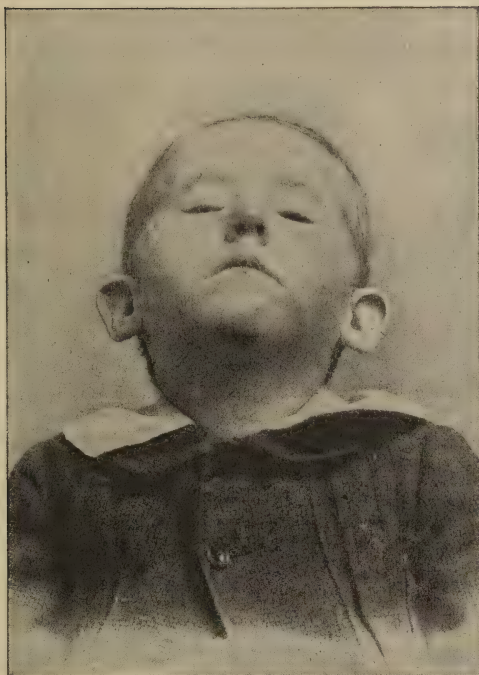
Case I. before operation.

FIG. 3.



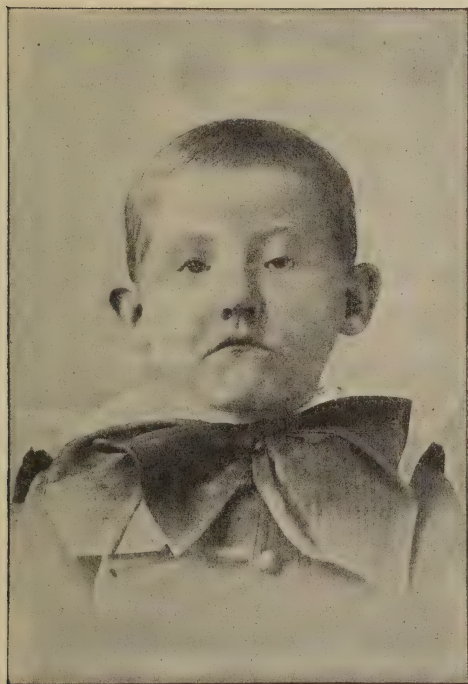
Case I. after operation.

FIG. 4.



Case II. before operation.

FIG. 5.



Case II. after operation.

shot the degree of elevation of the lid is quickly, easily, and accurately controlled without endangering the integrity of the wire by twisting. Then, if at any time after the operation it is desirable to modify its effects, it is only necessary to cut down upon the shot, which can readily be felt beneath the skin, and diminish or increase the effect by altering the length of the wire loop.

“As to the permanency of the result, the only thing that could unfavorably influence it would be the migration of the suture. The size and shape of this, together with the embedding of the shot, make this so remote a probability as to practically eliminate it from consideration.”

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children,

AND

LAWRENCE S. SMITH, A.B., M.D.,

Instructor in Clinical Gynæcology in the University of Pennsylvania.

Concerning Gonorrhœal Metritis. (*Centralblatt für Gynäkologie*, No. 50, 1895.) By Max Madlener, M.D., of Munich.

In a uterus and appendages, removed from a patient ten weeks after gonorrhœal infection and seven weeks after labor, Dr. Madlener and Dr. Beltinger were able to demonstrate the gonococci in the cervical and uterine mucous membrane, in the muscular wall of the uterus, and in the wall of the pyosalpinx. The diplococci were for the most part intracellular, though in many places they lay between the cells. After a minute description of the microscopical appearance of the specimens the author gives the following *résumé*: The gonococcus is capable of penetrating from the endometrium the muscular wall, and setting up inflammation there; this process may progress to suppuration, especially in the puerperium, but generally it is less violent; the gonococcus soon disappears from the muscular tissue, in rare instances passes through it to infect the peritoneal covering without infecting the tube.

Oöphorectomy per Vaginam. (*Centralblatt für Gynäkologie*, No. 12, 1896.) By E. Bumm, M.D., of Basel.

Bumm reports five ovarian cysts, two of them dermoids, operated upon through the vagina. He thinks the operation a simple one, even when the tumors are behind the uterus, if they are movable, and low down in Douglas's sac. Firm adhesions hinder the shelling out of the cyst and render previous hysterectomy necessary. He is particularly impressed with the

ease with which tumors may be reached through the anterior vaginal vault, and the satisfactory way in which the uterus and adnexa may be examined. The distressing symptoms of the first days after operation and the danger of subsequent hernia are much less than after an abdominal oöphorectomy.

A Contribution to the Knowledge of Septic Peritonitis. (*Centralblatt für Gynäkologie*, No. 12, 1896.) By Albert Sippel, M.D., of Frankfort.

Sippel reports an abdominal myomotomy that terminated fatally on the fifth day after operation, with symptoms of profound septic infection. At the autopsy the point of infection was found to be the uterine tissue from which the tumor had been enucleated and which had been sewed together with silk sutures. Bacteriological examination of pieces of this tissue and of the pus in the abdominal cavity showed pure cultures of staphylococcus albus. There was an acute yellow hepatitis, but cultures from the liver proved negative, as had also those made from the blood ten hours ante mortem. The wound in the uterus had been infected during the operation; the bacteria, finding a favorable medium in the partially devitalized uterine tissue, produced their peculiar toxine and worked through into the peritoneal cavity. This toxine depressed the power of resistance of the peritoneum, and, at the same time, irritated it to a free serous exudate. Experimentally the peritoneum is able to destroy considerable numbers of staphylococci unless its power of resistance is lowered by the introduction of the toxine,—it is the toxine and not the organisms themselves whose absorption causes the toxic symptoms. For the production of this toxine, a favorable culture medium is required, and one of the best is this peritoneal exudate. By affording free drainage either through the abdominal wall or through the vagina, as soon as symptoms of peritonitis appear, both the toxins already formed and the serous exudate may be carried off and absorption prevented. Any blood coagula or necrotic ligated uterine or ligamental stumps that may act as a propagating medium should be removed as completely as possible. This is especially applicable to the uterus in cases of septic puerperal endometritis, in which the large subinvolved organ is especially favorable to progressive infection. The author refers to a puerperal case reported by him two years ago cured by a supravaginal hysterectomy.

New Methods of Vaginal Antefixation of the Uterus. (*Centralblatt für Gynäkologie*, No. 10, 1896.) By E. Wertheim, M.D.

Noting that both vaginal and ventro-fixations of the uterus are apt to interfere with the normal course of subsequent pregnancy, when the fixation sutures are placed in the uterine tissue itself, Wertheim advocates the anchoring of the round ligaments and not of the fundus uteri to the anterior vaginal wall. He exposes the plica vesico-uterina through the anterior vaginal wall, and opens it by a broad transverse incision. He anteverts the uterus, exposing the round ligaments, and throws a ligature around first one and then the other. If the fixation is to be purely peritoneal, the liga-

ments are included in the sutures closing the angles of the opening in the plica, and the two ligatures mentioned first are withdrawn; but if the fixation is to be a firmer one, the original ligatures are passed through the vaginal wall on either side and the vaginal wound is then closed. Already four cases have been operated upon successfully by this method in Professor Schanta's clinic in Vienna, but too short a time has elapsed to determine whether satisfactory results will be permanent.

Concerning Prolapse and Pelvic Fixation of the Ovaries. (*Centralblatt für Gynäkologie*, No. 9, 1896.) By M. Säger, M.D., of Leipzig.

The author describes the ligaments of the ovary, its abnormalities in position, and the causes and symptoms of such abnormalities. The treatment he divides into non-operative and operative. In regard to the latter he finds that ventro-fixation of the uterus is not always effectual in holding the prolapsed ovaries up in their normal position, and proposes what he terms pelvic fixation of the ovaries as a supplemental operation. He restores them to their normal position by fastening them to the lateral walls of the pelvis by two fine sutures, passed through the mesosalpinx near the ampulla of the tube, and through the parietal pelvic peritoneum close to the ligamentum ovarico-pelvicum. In the two cases reported, the results were most satisfactory, the ovaries retaining the high position in which they had been fastened.

Fibroma of the Vaginal Wall. (*Journal of the American Medical Association*, February, 1896.) By John B. Murphy, A.M., M.D.

In the year 1882 there appeared from Keinwächter an article on "Vaginal Myoma and Fibroma,"¹ in which he collected fifty-three cases. This is the largest and, in fact, the only collection that I have been able to find. Breisky,² in the year 1886, added five to this number, which included the cases of Von Hermann, two from Gaye, one from Casewell, and one of his own. In addition to these, I find one from Hasenbalg³ and one from Archibald Donald.⁴ The one reported by E. Hasenbalg was polypoid in shape. Of the total number, twenty-nine were in the anterior, twelve in the posterior, five in the side, others not given. The tumor may reach a considerable size. Oliver and Jacob's cases weighed a kilogramme. In two old cases reported by Baudier and Gremler the tumor weighed ten pounds. They are more frequently sessile than pedunculated. The development of the tumor is extremely slow. It may be observed at all ages. Martin reports a case in a child at birth. Tractzl found one in a child fifteen months old. It produced obstruction of the urethra and rectum. They

¹ Zeitschrift für Heilkunde, vol. iii. p. 335, Prague.

² Die Krankheiten der Vagina, Deutsche Chirurgie, Lief 60, p. 163.

³ Zeit. für Geb. und Gyn., vol. xxiii., Part I., p. 52.

⁴ Med. Chron., January, 1889, p. 103.

are most commonly detected at middle age, and are often found in old people, where they have existed for many years.

The symptoms produced by them are merely mechanical,—i.e., pressure upon the bladder, urethra, rectum, and surrounding tissues. One case reported was accompanied by uterine hemorrhage. The diagnosis is not difficult to make, the greatest care being necessary to differentiate it from cysts in the vaginal wall close to the urethra and fibroma of the cervix uteri. It presents a smooth, hard surface, and can be distinctly separated from the uterus in the majority of cases. When located in the anterior vaginal wall, it usually begins at the urethra, close to the sphincter, and spreads laterally between the mucous membrane, as in the following case.

History.—S. B., admitted to the Mercy Hospital October 17, 1895. Family history negative. About four years ago patient noticed that a tumor projected from her vagina. It grew with moderate rapidity, and when about the size of an apple it ulcerated on the surface and gave a very offensive discharge. Up to this time the tumor had not caused any unpleasant symptoms, with the exception of a heavy, dragging sensation in the pelvis. She was operated on at that time (two years ago) and the protruding portion removed. About six months ago, she discovered that a prominence still remained in the anterior wall of the vagina. There was no pain nor discomfort. It has gradually increased in size. There were no urinary symptoms.

Examination.—The smallest portion of the tumor is apparently attached to the wall of the urethra in the median line. It extends from that point to the left, out to the margin of the pelvis. It can be distinctly separated from the uterus, to which it is not attached. The largest portion presses upon the left side of the pelvis, in front. Rectal examination shows that the tumor is about an inch from the cervix uteri, and hugs the left pelvic wall closely.

Diagnosis.—Fibroma of vaginal wall.

Operation.—An incision was made in the anterior vaginal wall, beginning at the urethra, and extending to the left an inch and a half. The surface of the tumor was exposed, and it was readily enucleated with the finger, from the submucous vaginal tissue. Cavity packed with iodoform gauze. Uninterrupted convalescence. The measurements of the tumor are nine and a half centimetres long, and five centimetres in diameter; the thick end being four inches and the smallest two and a half inches. It weighs fifty-seven grammes. The microscopic examination shows it to be a fibroma, consisting entirely of fibrous tissue, and nowhere was muscle to be seen.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,

New York City,

GUY HINSDALE, M.D.,

Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D.,

New York City,

AND

WM. G. SPILLER, M.D.,

Philadelphia.

A Case of Motor Polyneuritis of Slow Development, with Consecutive Lesions in the Spinal Cord. (*Comptes-Rendus hebdomadaires des séances de la Société de Biologie.*) By Professor Dejerine and Dr. Sottas.

The patient acknowledged previous syphilitic infection and excessive drinking. At the age of twenty-nine he became weak in all four extremities, as well as in the muscles of the neck, jaw, and tongue, and cramps were felt in the limbs. These symptoms progressed with periods of improvement. The weakness in the head later was limited to the muscles of the tongue. When examined two years after the commencement of the disease the paresis was more marked on the right side, the gait was that known as "stepper gait," the arms hung at the side, and the head was thrown back. The atrophied muscles reacted to the faradic current, and there was no reaction of degeneration. The tendon reflexes were very feeble, and sensation was perfect in all its forms.

Five years later the lower limbs were still weak and atrophied, the patella reflex was absent, the atrophy had disappeared, and power had returned in the arms, although some muscles still showed fibrillary contractions, the tongue was wasted and presented similar twitchings.

Death was due to tuberculosis.

At the autopsy the muscles of the extremities were found atrophied, with fatty degeneration in the lower limbs. The anterior spinal roots and nerves supplying the lower limbs were very small. The more peripheral portions of the nerves and their intramuscular ramifications showed degeneration. The intramuscular nerve-fibres of the lower limbs alone were diseased, and were less so than the anterior roots of the lumbar swelling. The anterior roots of the cervical region were less involved than those of the lumbar, while the posterior roots were everywhere normal. The cells of the anterior horns were altered throughout the cord, but not in proportion to the destruction of the motor roots.

Notwithstanding the cellular alteration, the mode of development of the disease, the nature of the morbid changes, the periods of improvement, the disappearance of atrophy and paralysis, existing at first in the head and neck and arms, the amelioration of symptoms in the lower limbs showed that the cells were not primarily diseased, for these are not restored when once destroyed. This view is made more probable by the greater alteration in the motor roots and nerves, as compared with that in the cells, shown especially in the cervical region, where the latter were almost intact.

The Primary Combined Systemic Disease of the Spinal Cord. (*Deutsche Zeitschrift für Nervenheilkunde*, 1895, p. 171.) By Max Rothmann, M.D.

Dr. Rothmann devotes many pages to a careful discussion of this disease. He expresses his views as follows:

1. The primary combined systemic disease of the cord must be considered as well defined from other forms.

2. It is clinically shown by simultaneous, or nearly simultaneous, symptoms, which indicate disease of the posterior and lateral columns. The patellar reflex is at first exaggerated, and either remains so until death or disappears in the last stages. The pupillary reflex is usually preserved. The process involves almost always the lower extremities first, and ascends.

3. The disease has a rapid course, and does not last over three years.

4. In the posterior columns the posterior root zones are not at first diseased, and the posterior roots usually escape. The crossed pyramidal and usually the direct pyramidal and direct cerebellar tracts are involved, with slight changes in the rest of the antero-lateral columns.

5. In many cases the gray substance of the cord is altered.

6. The whole process can be best explained by a primary affection of the gray substance. Pernicious anæmia and concussion of the spinal cord are important causes, whereas syphilis cannot be so considered.

7. The cases of tabes of long duration, with secondary involvement of the lateral columns in the last stages, and those of spastic spinal paralysis, due to degeneration of the crossed pyramidal tracts, with secondary affection of the columns of Goll, must be distinguished from the primary combined systemic disease.

Dr. Rothmann records three cases,—in one of which pernicious anæmia had been present,—the duration of which did not extend over half a year. The first symptoms were weakness and paræsthesia in the lower extremities. The patellar reflex disappeared in two cases, and became feeble in the third; probably it had at first been exaggerated in all three. Paralysis of the diaphragm was the cause of death in two of the patients. The disturbance of sensation was at first less marked than that of motion, but in two cases the loss became absolute. Vesical and rectal symptoms were present. The tendency of the disease to ascend from the legs to the trunk and arms was clearly shown.

The tracts above mentioned were found diseased. This type differs from Friedreich's form, chiefly in absence of heredity, the age of development, the acute course, and in absence of marked degeneration in the posterior roots.

A Case of Landry's Paralysis, with Recovery. (*Deutsche medizinische Wochenschrift*, November 21, 1895.) By Dr. Behrend.

A man of thirty-seven years, after alcoholic excess and exposure to cold,

had disturbance of sensation in the mouth, neck and chin ; two days later, paralysis of the legs developed, followed in a short time by loss of power in the trunk and arms, and by difficulty in swallowing and speaking. It was impossible for him to raise himself or to maintain a sitting posture. The pupils reacted slowly, and the sixth nerves were paralyzed. Objective sensation was diminished over the chin, but was normal over the trunk and limbs, perhaps a little delayed in the legs. The face appeared somewhat rigid, and the naso-labial folds were not distinct. Whistling was impossible. Regurgitation of fluid through the nose occurred in attempts to drink, and a portion entered the larynx. No tenderness to pressure over the spinal column, or over nerve-trunks, was present. Slight motion was possible in the arms and knees. The patella reflexes were absent. The electrical reaction of the paralyzed muscles was good at all times. Two attacks of dyspnoea, with anxiety, occurred. Two months after the beginning of the disease the patient was able to walk with a cane, although his gait was unsteady, and the patella reflexes still failed ; otherwise, restitution was complete.

Dr. Behrend considers the case as belonging to the bulbar type (Leyden) of Landry's paralysis, as distinguished from the neuritic form. The nerves could not have been involved, as the electrical irritability was preserved, nor could a true organic lesion have existed which had ended in recovery.

He considers the cause a functional disturbance due to alcoholic intoxication.

A Case of Isolated Total Right-Sided Trigeminal Paralysis. (*Wiener klinische Wochenschrift*, No. 10, 1896.) Presented by Dr. Hirsch in the Verein für Psych. u. Neurol. in Vienna.

Neuralgic pains and disturbances of sensation developed in a patient in the area innervated by the right trigeminal with paralysis of the muscles of mastication. The cause was unknown. The right-sided corneal reflex was slow, the scleral reflex on this side failed. A mild type of conjunctivitis and a lessened lachrymal reflex to irritation were noted on the same side. In opening the mouth, the jaw went to the right with a slight subluxation. The sense of taste was disturbed on the right side. The relaxation of the tympanic membrane was due to disturbance in the function of the tensor tympani. The tensor veli palati was paralyzed on the side of the lesion. Reaction of degeneration was noted in the right temporal and masseter muscles.

After a time the symptoms improved, although power in the muscles of mastication on the right side remained feeble.

Salicylate of soda and phenacetin were used in treatment. The peripheral nature of the lesion, the progressive amelioration probably from antirheumatic drugs, the absence of any known cause led to the diagnosis of a rheumatic process. The trigeminal is so well protected that it seldom becomes diseased in this way.

Glioma of the Cerebellum.—Dr. E. D. Fisher presented at the last meeting of the American Neurological Association a tumor of the cerebellum. The interesting feature of the case was the absence of any symptoms that could be directly referred to the cerebellum. There had been no incoördination or any staggering in the gait. The pain had been situated principally over the right orbit. The only well-defined cranial lesion had been that of the eighth nerve on the right side, with absolute deafness. There had possibly been a slight involvement of the seventh nerve on the right side, and the patient had said she had complete loss of smell. The general symptoms of a cerebral tumor—namely, headache, convulsions, and optic neuritis—had been present. A lesion at the base of the brain had been suggested by the cranial-nerve lesion, with involvement of the cerebellum; the absence, however, of cerebellar symptoms, and the localization of the pain so definitely over the right orbit, had led to an exploratory operation in that situation. The tumor had not been found at the time, but there had been complete relief from the pain and the convulsions until the time of death, eleven weeks later, which had been caused by a septic basilar meningitis. The autopsy had revealed a glioma involving the right cerebellar hemisphere. The operation had been by the bone-flap method.

Disseminated Sclerosis. (*Berliner klinische Wochenschrift*, No. 9, March 2, 1896.) By Professor H. Oppenheim.

After referring to infectious diseases, among which influenza and malaria may be included, Professor Oppenheim speaks of intoxication by chemical and metallic poisons, lead, phosphorus, etc., in the etiology of disseminated sclerosis. He mentions that Krafft-Ebing attributes many cases to the effect of cold.

While it is true that the fully developed disease is rare in childhood, and that only a few doubtful autopsies of such cases are recorded, it is not true that the disease does not begin at this period. It is a disease which often lasts twenty to thirty years, and may have periods of exacerbation separated from one another by long intervals. Oppenheim has traced the initial phenomena, such as disturbances of sight or temporary paralysis, back to early life.

In eleven out of twenty-eight cases he has obtained the history of occupation in metallic poisons. Trauma also plays a part in the etiology, and in some cases there may be a congenital predisposition, as demonstrated by the development of certain symptoms in very early childhood.

The autopsy in one of his cases showed an inflammatory process which had begun about the vessels of the white and gray matter, and had caused ascending and descending degeneration. A diffuse inflammatory process may thus produce the symptoms of disseminated sclerosis.

In another case the tremor and spastic paresis were limited for many years to one-half of the body and the intellect was very feeble. The autopsy showed some slight changes in the cord and a patch of sclerosis, which

occupied almost the entire corpus callosum. (Hemiparesis or hemiplegia, with some weakness on the other side of the body, has been noticed in tumors of the corpus callosum.)

A third case could be traced back beyond a doubt to the fourteenth year. A disturbance of sight was the only cerebral symptom for twenty years. At one period thermo-anæsthesia in the leg was the only modification of sensation.

At an early period the diagnosis of disseminated sclerosis may be easy, later it may be impossible, as the symptoms frequently disappear,—a peculiar feature of this malady. Intention tumor is not a descriptive term, for the trembling is not only in intentional, but also in associated, reflex, and automatic movements.

Romberg's sign, as well as unilateral enlargement or diminution of the palpebral fissure and of the pupil, may be found in multiple sclerosis.

The disease may begin as acute encephalitis pontis. Temporary dementia may last for hours or months, and disappear only to reappear later. Such exacerbations may be due to over-exertion, taking cold, trauma, and especially the puerperium.

Subconscious Fixed Idea.—The importance of the subconscious fixed idea in the production of morbid phenomena is very lucidly illustrated in a paper by Pierre Janet, in the June number of *Revue de l'Hypnotisme*, an abstract of which has been contributed by Dr. William Romaine Newbold to a recent number of the *American Naturalist*.

Janet first gives a typical case of conscious fixed idea. A woman, aged thirty-eight years, of neurotic ancestry, falls in love at first sight with the physician called to attend her child, and for some years remains under the control of this fixed idea. Here we have (1) marks of mental weakness; (2) an irrational passion attached to one idea; (3) its natural consequences in words, acts, etc. Four other cases are then detailed, precisely analogous, save in the absence of the second factor, there being no conscious fixed idea. An hysteric woman, aged twenty-one, has repeated attacks of vertigo and groundless terror. Another sustained, at twenty-nine, three distinct shocks: her father lost his money, a near friend died of phthisis in her presence, and she saw a man crushed to death. For four years afterwards she fell into an apparently dreamless sleep upon the least shock. A woman of neurotic family, a sister insane, father and grandfather drunkards, has monthly attacks of mental and physical distress which end in an uncontrollable desire to drink. After a spree of several days' duration she recovers consciousness, but has no memory of the attack. While in her normal state she is a total abstainer and abhors liquor. In all these cases there is no conscious fixed idea, but when the patients are hypnotized, it apparently comes to light.

Case I., in hypnosis, tells of a horrible dream she once had, in which she jumped from a bridge; the recurrence of this dream produces the

vertigo. When a child she was frightened by a snake, and she claims that the terrors are due to seeing snakes about her. Case II. is told, while hypnotized, that when she falls asleep she is to dream aloud; her dreams are invariably repetitions of her friend's death-scene. Case IV., in hypnosis, confesses to an insane desire to drink, of her normal self is wholly unconscious, and Janet, in tracing the history of the case, ascribes this to the fact that in her earlier convulsive attacks, the suggestion to drink was constantly given her by the presence of her drunken father. Case III., hypnotized, has no memory of dreams which could have caused her annoying trouble, but her hand, in automatic writing, tells of nightmares utterly unknown to her, during which micturition takes place. From a study of these cases Janet draws the inference that in all of them a fixed idea exists subconsciously, which produces in the higher consciousness effects analogous to those produced in the first case by a conscious fixed idea.

"What is the Value of Operative Treatment in Epilepsy" is the title of a paper by E. Gaillard Mason, of New York, which presents some interesting data, with result and conclusions of decisive value and importance. The paper is based upon an analytical study of seventy cases, collected from contemporaneous literature,—only cases involving operations upon the skull or brain are included, the writer not touching the subject of operative measures for the relief of various sources of reflex epilepsy. Of the seventy cases, three are recorded as positively cured and the claim admitted; six are stated to have been improved, fourteen were not benefited at all, three died under the operation, and one case ended fatally from malignant disease. Of the remaining forty-three cases, in two the fits ceased after the operation, but, as bromides had been continued, the cause of the cessation remained in doubt; in thirty-eight cases the interval of time subsequent to the operation is said to have been too short to justify any positive conclusions as to the results, and in three cases the interval of time is not mentioned at all, so that no conclusion whatever could be reached with regard to them. In all, or most, of these undecided cases (forty-three in number), however, the reporters claimed either partial or decided benefit, and in some instances cure. While I agree with the author that such claims are not permissible until time shall have established their truth, I am none the less convinced that it is a legitimate inference that a proportion of these forty-three cases, equal to the proportion in the series of twenty-seven, will eventually show a cure. This would give eight cases out of seventy, or perhaps nine, since none of these forty-three have died, while four of the other twenty-seven proved fatal. This would give about fifteen per cent. of cures, with a mortality of five and a half per cent., an exceedingly favorable showing when compared with the ratio of recoveries to cases treated by any other method. Not a few neurologists are profoundly sceptical as to any *cures* of epilepsy from drug treatment. The statistics of operation would present an aspect even more favorable if proper intelligence and discrimination were exercised

in the selection of cases for operation. Several of these seventy, as the author states, should never have been touched by the surgeon, and he especially emphasizes this necessity for proper selection, in certain broad principles to be observed, outlined as follows:

(1) Always consider an epileptic fit as a symptom of some underlying condition. (2) Inquire particularly and very carefully about the first convulsion,—What was its apparent exciting cause; what was its character, general, or affecting only certain portions of the body, and what portion of the body was affected at the beginning of the fit? (3) If there was an aura, investigate it carefully, as it will not infrequently give a clue as to the seat of the lesion. (4) If there had been a trauma or a suspicion of trauma, shave the head and look carefully for a scar or a depression. If there is evidence of a trauma in a position corresponding to the initial symptoms of the fit, an operation is usually justifiable. (5) If you cannot get a clear history of the case, give a placebo, and place the patient under competent surveillance until you can satisfy yourself as to the character of the fits. (6) Do not operate on a porencephalic child and expect to cure the epilepsy. Do not, as a rule, operate on a case of post-hemiplegic epilepsy in a child and expect to cure. (7) Do not operate on an old, idiotic epileptic, a victim of idiopathic epilepsy, with general convulsions of years' standing.

The author's final conclusions are as follows:

“(a) A certain small proportion of cases will be cured.

“(b) A certain larger proportion will be improved.

“(c) An even larger proportion will not be improved at all.

“(d) An operation upon almost any case will produce a temporary cessation of fits.”

It will be noted that the author's conclusions are based practically upon the results in the twenty-seven cases only. An analytical study of the whole series, as already outlined, would justify a decidedly more optimistic view of the value of operative treatment for epilepsy.

Insanity treated with Thyroid Extract. (*Fourth Annual Report of the Sheppard Asylum, Baltimore, 1896.*) By E. N. Brush, M.D.

The author states that within the last year the thyroid gland has been used at this institution in a few cases which were deemed suitable. In several instances improvement was rapid and marked. One patient is now at her home, of whom it was thought for months that nothing further could be done. In her case the change from noise, turbulence, and destructiveness which occurred almost immediately following the administration of the gland in a desiccated form was astonishing, and the physical change which soon followed was similarly remarkable. In the three years which have elapsed since this method of treatment was introduced many disappointing failures have resulted, and many more will undoubtedly follow. We know as yet but little of just what character of cases, aside from those

associated with myxœdema, are best suited to this form of treatment. Chronic mania, dementia, and melancholia have all yielded in some instances to its influence. We are, moreover, ignorant of its exact physiological action. Carelessly given it is a dangerous drug. It has a powerful influence upon the heart and upon the whole nervous system. It produces rapid tissue-change in the body with loss of weight, and there is a resulting sense of bodily weakness and depression.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Animal Life with Absence of Bacteria in the Alimentary Canal.
(*Hoppe-Seyler's Zeitschrift für physiologische Chemie*, November 26, 1895.)
By George H. F. Nuttall and H. Thierfelder.

A unique experiment has been performed by these writers for the purpose of ascertaining whether young animals born by Cæsarean section in a sterile room and treated with sterile air and food can maintain life.

The hen's egg was naturally suggested as offering many advantages for this research, but as a great percentage of eggs are infected, the guinea-pig was chosen, the young having great self-dependence and presenting no special difficulties for this research.

An apparatus was arranged which consisted of a bell-jar placed over a cylindrical glass vessel containing four centimetres of water and a layer of two centimetres of oil. Between the two vessels a wire gauze was stretched on which to place the animal. The apparatus was made air-tight with rubber bands. On one side of the bell-jar an opening was closed in with a rubber glove, into which the hand could be inserted when the animal was held while feeding; and on the other side an opening, also closed in with rubber, admitted the nipple of the feeding-bottle. The glass vessel was placed in a copper tray filled with water, which served as a thermostat, and by a gas-burner beneath kept the bell-jar at a temperature of 24° to 25° C.

Germ-free air was supplied by passing air through a cotton filter and a spiral coil of lead to an aspirator water-pump, from this to tubes filled with chloride of calcium, then through a cotton filter, a copper tube, a platinum spiral raised to red heat by a Bunsen burner, another copper tube, again through a cotton filter, into a tube which entered the bell-jar. The

air in passing out was conducted through a cotton filter and a flask of mercury to a gas-meter.

The operation was performed in a sterilized room, the apparatus being sterilized the day before the operation, and left in the sterilizer until the moment of its use.

Cæsarean section was performed whenever the secretion of milk indicated the approach of spontaneous birth. The animal was prepared by shaving the abdomen and thoroughly sterilizing the skin. It was then chloroformed, the uterus was opened, and the young quickly removed and placed in the apparatus, in which ventilation had already been started.

The young animal was fed after twelve hours with sterilized cow's milk, and from that time it was fed regularly every hour, day and night. The first feeding was difficult, but after the third day the rubber glove was seldom used. The fæces were of normal consistence and of a brownish or dark-greenish color.

The animal remained perfectly normal and healthy for eight days, when it was killed, and the fæces examined by microscopical and cultural methods for micro-organisms. The contents of the intestine were found to be perfectly sterile.

The writers conclude from these investigations that the presence of bacteria in the alimentary canal is not necessary for the maintenance of life in the guinea-pig, and probably not for other animals and man if the nourishment is of an animal nature. With a vegetable or mixed diet further investigation must decide the question.

A. W. P.

Changes in the Nerves in Spontaneous Sphacelus. (*Meditzinskoje Obozrenije*, No. 16, 1895.) By W. W. Muravieff, M.D.

The very scanty knowledge on this subject induced the author to undertake a series of examinations, using the crural nerves for this purpose. After hardening them in chromic acid and alcohol he cut diametric sections and stained them with carmine, picro-carmine, and nigrosine, according to the methods of Van Giesen and Pal. The typical picture of all the preparations showed the following peculiarities: connective tissue of the nerve was much thickened and was surrounded by large rings, the roundish nerve bundles being pressed and wrinkled; in the external part of this membrane, arteries a little larger, with greatly-thickened walls (at the expense of the intima), were seen, as well as irregular lumina in the shape of fissures; some of the vessels were entirely obliterated, with signs of general sclerosis; small arteries were seen in great quantities, but in an inflammatory state, as were also the veins, though in a less degree. The thinness of the nerve-fibres was noticeable, as well as the loss of myeline, and in some places the disappearance of the axis-cylinder. Spontaneous sphacelus of the extremities may, according to the author, be summed up as (1) an inflammation of the arteries, especially of their intima (endarteritis), and (2) sclerosis of the nerves, in which the affection of the arteries may be regarded as a primary

process, so accepted by the majority of writers who have investigated this subject.—*Universal Medical Journal*, January, 1896. J. M. S.

Sudden Death from Occlusion of the Coronary Arteries. (*Medical Press and Circular*, December 25, 1895.) By Herr Oestreich, M.D.

At a meeting of the Verein für Innere Medicin, the author related a case of this kind in an officer, aged thirty-two, who had always been healthy and who died suddenly on his wedding night. In the ascending aorta several very small atheromatous ulcerations were found upon post-mortem examination. Upon one, lying near and just above the point where the right coronary artery was given off, was a pediculated thrombus the size of a cherry-stone, which hung down and closed the vessel. The thrombus consisted of an older and a newer portion, the latter apparently quite recent. The left coronary artery contained an embolus one centimetre in length, resembling the older part of the one just mentioned. The heart was otherwise healthy and the other organs were sound.

In the discussion, Herr Leyden said that occlusion of both arteries was very rare, the left one being usually affected. He had only seen the right affected once; in that of an old lady. He had seen four cases in which sudden death followed intercourse, but in all the cases connection had been illicit.—*Universal Medical Journal*, January, 1896. J. M. S.

Cocaine in the Study of Pond-Life. (*Microscopical Journal*, March, 1896.) By H. N. Conser, of Sunbury, Pa.

The writer suggests the use of hydrochlorate of cocaine as a narcotic for studying forms of aquatic life, such as the bryozoans and the encased rotifers.

Several colonies of fresh-water bryozoa are placed in a watch-glass with five cubic centimetres of water, and as soon as the animals have expanded, one or two centigrammes of cocaine are dropped on the edge of the water at two or three distant points. In fifteen minutes the narcotic influence is sufficient, as can be tested by touching the tentacles with a needle. One per cent. chromic acid is now poured in to fill the watch-glass and left to act for half an hour or more, when it is nearly all withdrawn and water substituted. This process is repeated in half an hour and alcohol to form about twenty-five per cent. added to the water; the strength of alcohol is increased by the addition of ninety-five per cent. alcohol until eighty per cent. is reached. By this means the chromic acid is washed out and the hardening accomplished so gradually that no distortions occur. For staining, borax-carmines or alcoholic cochineal is used. The clearing must be gradual, and is best accomplished by adding oil of lavender to the ninety-five per cent. alcohol in which the animals are kept, and after an hour bringing them into oil of lavender, from which, after perfect clearing, they are mounted in balsam.

[It would be well worth trying this method for the staining of flagellate

bacilli, and many of the higher vegetable and animal forms of life with which we are especially concerned in medicine.—H. W. C.]

Anchylostoma Duodenale: Is it Wide-spread in India, Assam, and Ceylon, and is it a Harmless or a Harmful Parasite? (*Indian Medical-Chirurgical Review*, October, 1895.) By Hayman Thornhill, M.D.

The writer gives extracts from the reports of Surgeon-Major Dobson, of Assam, and Dr. McConnel, of Calcutta, for the year 1892, in which they express doubts as to whether a specific disease is produced by the presence of the anchylostoma in the intestine, to which the term anchylostomiasis may be applied. He considers it a matter of importance from a public-health point of view to decide the question and to take measures to limit the spread and to mitigate the effects of this disease. He asks the Indian Medical Congress to express its opinion as follows: The anchylostomum is one of the most harmful and dangerous of human parasites; when present in the intestine in large numbers and for a certain period it produces a specific and dangerous anæmia; in the future it should be known by the name of anchylostomiasis so as to distinguish it from true beriberi, which is characterized by the presence of neurotic symptoms.

The figures and statements in the Assam report show that the parasite is widely distributed through that region. Dr. Dobson gives the results of the examinations of the fæces of hundreds of healthy-looking coolies and other persons, and the finding in them of anchylostoma, and he infers that because these coolies appeared healthy the parasites must be harmless. He has not taken into consideration that small numbers may be present for long periods and large numbers for short periods without causing serious or any symptoms. The effects produced will vary according to the state of health of the host.

This disease in regard to extensive prevalence and destruction of life and labor is second only to malarial fever, which is the terribly destructive and depopulating disease of the sparsely populated, low-lying, unhealthy divisions, while anchylostomiasis takes its place and is almost equally prevalent and destructive in the higher portions of the province, which are comparatively free from malaria.

The only effectual method for checking the wide-spread destruction of life due to this preventable cause is the prevention of the pollution of the ground about dwellings, on estates, and in towns and villages, by the provision and proper cleansing of sufficient and suitable latrine accommodations being rendered obligatory, and by their use being insisted on, the committing of nuisances being made penal.

The Myelocyte of Ehrlich. (*Boston Medical and Surgical Journal*, January 2, 1896.) By Richard C. Cabot, M.D.

The myelocyte or marrow cell is usually described as a very large, round cell, three or four times the size of a red corpuscle or even larger, and con-

taining a round or oval nucleus which usually lies eccentrically. The protoplasm is filled with fine, irregularly-shaped granules, which, when stained by Ehrlich's method, are neutrophilic, and take a reddish-violet tinge, the nucleus staining light blue or greenish-blue.

The study of these cells in leukæmia and other diseases has caused the writer to modify some of the details of this description.

In regard to size, he has found, by measuring cells which correspond otherwise to the description of myelocytes, that the diameters vary from seven to twenty-three mikrons; and in four cases in which bone-marrow was examined, the same range of variation in the diameter of the otherwise typical leucocytes was found. It seems impossible, therefore, to distinguish myelocytes from other cells by their size alone, for cells of all sizes are found which resemble myelocytes in all other respects.

The myelocytes naturally show the round shape of all non-amœboid leucocytes; but amœboid and non-amœboid cells are alike spherical in most instances in stained specimens, so it is difficult to distinguish sharply between myelocytes and the polynuclear cells by their shape.

The number and shape of the nuclei is no final criterion, for myelocytes may have either one or more nuclei, and polynuclear cells may have only a single oval nucleus.

The staining properties of the nucleus seem to be the most constant factor for differentiation. The nucleus of the polynuclear cells usually stains darker and more unevenly than that of the myelocytes, patches of pigment being seen on a lighter ground. In the myelocyte the purplish or greenish tint is always pale, and nearly always even, while the edges of the nucleus are less sharply defined than in the polynuclear cell. This difference in staining is not, however, invariable, and in doubtful cases the shape of the myelocytic nucleus, being round or oval, is generally to be contrasted with that of the polynuclear cell, which is twisted or broken.

The writer suggests the following definition for the myelocyte: A myelocyte is a spherical, neutrophilic cell, varying in diameter from seven to twenty mikrons or more, and characterized by the presence of one (rarely two) nuclei which stain faintly and evenly with a purplish or greenish-blue color. The nucleus is generally round or oval, and often vacuolated, and is in close relation to the surface of the cell for a comparatively large portion of its extent.

An estimation of the leucocytes found in eleven cases of leukæmia leads the writer to think that the percentage of myelocytes in leukæmia is much larger than that generally given in text-books.

Flagellated Bacteria.—The hair-like appendages, common to all microscopic, motile spores, form the locomotor apparatus by which infusoria, zoöspores, and bacteria are propelled. They vary much in number in different varieties of bacteria and also in the bacilli of the same culture. These filaments are either diffuse—situated around the cell body—or polar,—given

off from the extremities. They are from three to fifty mikrons in length, and present wavy or straight lines, rings, and uncurved and looped filaments.

Because of the great difficulty with which flagella are stained, and the conflicting statements of the few observers who have devoted themselves to this work, our knowledge of the morphology of flagellated cells is somewhat confused. To Löffler we owe the first knowledge of the diagnostic value of staining flagella, and his method, first stated in 1889, modified a year later, is now the one generally used, and from which the best results are obtained.

By this method a protoplasmic capsule, faintly colored, is seen around the intensely-stained bacillus and slightly separated from it. Zettnow, Bütschli, Stoecklin, and others consider the bacillus as a unique morphological element of the micro-organism like that which forms the nucleus of a giant-cell. The chromophilous protoplasm of the nucleus takes up most stains readily, but the body or capsule requires the more energetic action of a mordant stain. The flagella are given off from the capsular protoplasm, but they do not always seem to be a part of it. V. A. Moore says that in a large majority of the bacilli examined by him the flagella appear to radiate from the so-called nucleus of Bütschli. Moore has studied the structure of the flagella-producing substance in the cilia of the zoöspores or swarm spores of certain fungi, and thinks it probable that there is a close resemblance between the flagella of bacteria and those of the swarm spores. He speaks of two views for the disposition of the flagella of swarm spores, which, according to Rothert, are both correct. The latter observed that in the first swarm stage of saprolegnia the flagella are drawn back into the body of the protoplasm; but in the second swarm stage of saprolegnia and of peronosporæ (downy mildews) they are cast off as soon as the spore is at rest, or they remain permanently attached to the cell.

Stoecklin found, in a variety of the colon bacillus, flagella which looked like rough prolongations of the capsular substance that had not attained their full development. He thinks that the aspect of the bacillus is influenced by the age of the culture. Two bacilli are sometimes found in one capsule, and in such instances the number of flagella are doubled; or flagellated capsules without bacilli are seen.

The following directions for staining flagella are taken from the recent edition of Günther's "Bacteriology":

The culture to be used should be a surface culture on freshly-prepared agar, and its motility proved by the examination of a hanging drop. The cover-glasses should be carefully cleansed with alcohol and passed through a flame.

Put a drop of clean water on a cover-slip, and with the point of a platinum needle distribute the bacilli to be examined. Pass the air-dried cover-slip three times through a gentle flame.

Löffler's mordant, which consists of ten cubic centimetres of a twenty-per-cent. solution of tannin, five cubic centimetres of a cold saturated solu-

tion of ferrous sulphate, and one cubic centimetre of an alcoholic solution of fuchsin, and should be several weeks old, is then filtered upon the cover-slip and allowed to remain from one-half to one minute. Heating is not necessary and is even injurious. Wash the mordant off and dry the cover-slip in the usual manner by blowing.

Then stain with a freshly-prepared watery-alcoholic solution of fuchsin, warm the cover-slip over a flame until steam is given off, let it stand for one minute, then wash carefully, dry quickly, and mount in xylol balsam.

Bunge has modified Löffler's mordant by using three parts of a saturated tannic acid solution and one part of a 1:20 solution of liquor ferri sesquichlor. To each ten cubic centimetres of this mixture one cubic centimetre of a watery solution of fuchsin is added, and the stain used after it is quite old.

By this and by Van Ermengeni's silver nitrate method good results may also be obtained.

A. W. P.

On the Verification of Sugar-Testing in the Urine. (*Practitioner*, January, 1896.) By Sir William Roberts, M.D., F.R.S.

The testing for sugar in an ordinary diabetic urine, whether by fermentation or by Fehling's solution, yields indications which are doubtful when the quantity of sugar is very small while the normal ingredients are present in their usual or in excessive proportion. The fermentation test yields no obvious sign when the urine is impregnated with sugar to a less degree than 0.5 per cent., and Fehling's test fails when the proportion of sugar ranges much under 0.1 per cent. Uric acid and creatinine exercise a reducing action upon Fehling's solution, and where these are abundant and sugar is scanty the indications of the test are difficult to interpret. If such a urine is passed through animal charcoal three times in succession, it will be rendered colorless and the uric acid and urates will be completely removed, while sugar passes freely through the charcoal with the liquid portion of the urine. Albumin is also removed largely, but not entirely, when the urine is subjected to this treatment. After such a process the filtrate can be treated with Fehling's solution as follows: A test-tube is charged with Fehling's solution to the depth of about a quarter of an inch, and the filtrate is added to the depth of about two inches, the two fluids are then thoroughly mixed, and heat is applied to the upper half of the column of liquid until the boiling point is reached. If sugar be present a comparison of the two portions of the fluid in the tube will show that the upper portion has lost its blue color and has become yellowish.

On the Spleen in the Infectious Diseases. (*Gazette des Hôpitaux*, January 4 and 5, 1896.) By M. Fernand Bezançon, of Paris.

After an exhaustive study of the anatomy and physiology of the spleen, both in its normal state and in states modified by the influence of the infec-

tious diseases, the author concludes that, in the case of septicæmia, the spleen, on account of its rich net-work of capillaries, arrests in varying proportions a certain number of free bacteria and of leucocytes containing bacteria, depending upon the variety of micro-organism present. A certain proportion of these bacteria are destroyed, either by the endothelial cells or, especially, by the mononuclear leucocytes of the organ. This function of the spleen is inactive in local infections. But the most important is its physiological function of forming a large number of leucocytes, or of transforming young leucocytes into adult forms, which, from the spleen, are diffused through all the organism and are carried to the points invaded by the bacteria. According to the nature of the toxins secreted by the bacteria and according to their chemotactic property, this call on the leucocytes will be more or less active. The efficiency of this function will depend upon whether it is or is not hindered by the necrosis of the newly-formed elements. The spleen, in this rôle, is active, both in local and in general affections, and it shares the genesis of leucocytes with the bone-marrow and with the lymph-nodes.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

CONSENT OF WIDOW NECESSARY TO AUTHORIZE AN AUTOPSY ON THE BODY OF HER DECEASED HUSBAND.

A SURVIVING wife is entitled to the possession of the body of her deceased husband in the same condition as when death occurred, for the purpose of giving it proper care and burial, and she may sue for damages a physician or other person who, without her consent, unlawfully or wantonly dissects or mutilates the body before burial.¹

The law was thus laid down by the Appellate Division of the Supreme Court of New York, in an opinion by Mr. Justice Patterson, in which he says, "The question presented in this case seems to be one of first impression in this jurisdiction, and comes before the court on appeal from a judgment overruling a demurrer to the complaint. Stated with precision, the inquiry is whether the defendant is liable civiliter, and to this particular plaintiff, for the unlawful dissection of the remains of her husband,—an act

¹ *Foley vs. D.*, 37 N. Y. S. 471 (1896).

not only unlawful, but constituting, on the assumption that the facts alleged are true, a criminal offence."

The complaint sets forth that on May 16, 1894, the plaintiff's husband fell through an elevator shaft in a building in the city of New York, and was taken, in an unconscious condition, to the Bellevue Hospital, where he died three hours after his admission; that the plaintiff was a loving and devoted wife, and was under the duty and obligation, and had the right, of burying her husband; that she applied at the hospital for his body, and begged and implored those who were in charge of it not to allow or permit an autopsy to be performed, and gave notice that she would immediately send an undertaker for the body to remove it to her home, where it would be prepared for burial; that, notwithstanding her request and protestations, the defendant, without her knowledge or consent, procured, assisted, aided, and abetted in performing an autopsy on her husband's body, which autopsy was performed without any authority of law, and was wilfully done, by cutting open and otherwise abusing and maltreating the dead body. The complaint then proceeds to state matter intended to be in aggravation of damages, and ends with a demand for a money judgment.

The defendant's demurrer sets forth two objections to the maintenance of this action:

First, That if any one may bring an action of this kind, it must be the next of kin, and not the widow; *second*, that there is no such thing as property in human remains, and consequently no right of action in any one for their mutilation.

In support of the first objection it was argued that, in the absence of testamentary direction on the part of the deceased, the exclusive right of burial and of designating the place in which human remains shall be interred, is with the next of kin; and cases were cited which, in general terms, seemed to sustain this view. "Those cases," says Mr. Justice Patterson, "are referred to and cited in an opinion of Mr. Justice Landon in the case of *Snyder vs. Snyder*,¹ and in commenting upon them that learned judge says, 'Most of the cases there referred to arise with respect to the right to protect the place where the remains were buried; to prevent a disinterment, or to collect from the executors, or relatives of the deceased, the expenses of the funeral. In the absence of a contention prior to burial, as to the right between relatives to designate the place of burial, the broad doctrine that the right rests exclusively in the next of kin, can hardly be construed as a judicial exclusion of the right of the widow.' In this case it will be observed that the question is directly presented with reference to the duty and right the widow owes and has to and over the body of her dead husband prior to interment,—that is, before the remains have passed beyond the necessity of human care and attention. It is provided by the penal code of this State that the dead body of a human being lying within

¹ 60 How. Pr. 370.

this State must be decently buried within a reasonable time after death. The duty must be performed by somebody. It has been held in this country that the primary duty of burying a deceased wife is upon the husband. And it has been expressly determined that if a husband and wife are living together at the time of the death of the former, the widow's right to the possession of the dead body, for the purpose of preservation and burial, is a right in the widow paramount to that of the next of kin. We think, therefore, as matter of law upon the facts as they are stated in the complaint, and without reference to the allegation of the plaintiff's duty and right, she may maintain this action, if it may be maintained at all. The foregoing observations are made to meet the possible suggestion that the allegation of the complaint respecting the duty and right referred to is merely one of a conclusion of law, and, of course, if it is such, it is not admitted by the demurrer. But construing the words of the complaint with reference to this matter as we think they should be construed, they are equivalent to an allegation that, as a matter of fact, the plaintiff was the person upon whom had devolved the obligation and responsibility of complying with that requirement of the law respecting the interment of human remains, to which reference has been made, and that the demurrer admits she was such person.

“This brings us to the second objection involved,—namely, that concerning the right in any one to maintain an action at all. The ground of this objection as urged by the appellant is that there can be no such action because there can be no such thing as property in human remains. By the common law, *stricti juris*, the proposition as to property may be maintainable. A long line of judicial decisions appear to have established a general doctrine to that effect; but courts of equity have frequently interfered to protect the remains of the dead, and courts of law have also afforded remedies through formal legal actions wherever any element of trespass to property, real or personal, was associated with the molestation of the remains of the dead. In recent times the obdurate common law rule has been very much relaxed, and changed conditions of society and the necessity for enforcing that protection which is due to the dead have induced courts to re-examine the grounds upon which the common law rule reposed, and have led to modifications of its stringency. The old cases in England were decided when matters of burial and care of the dead were within the jurisdiction of the ecclesiastical courts, and they are no longer absolutely controlling. Thus, in the case of *Pierce vs. the Proprietors, etc.*,¹ it is stated by the court, ‘That there is no right of property in a dead body, using the word in its ordinary sense, may well be admitted; yet the burial of the dead is a subject which interests the feelings of mankind to a much greater degree than many matters of actual property. There is a duty imposed by the universal feelings of mankind to be discharged by some one towards the

¹ 10 R. I. 227.

dead,—a duty, and we may also say a right, to protect from violation, and a duty on the part of others to abstain from violation; and it may therefore be considered as a sort of *quasi* property, and it would be discreditable in any system of law not to provide a remedy in such a case.’ But we are not disposed to put the right of the plaintiff to maintain this action on the ground of a property right in the remains of her husband; nor do we think that the discussion is properly placed when it is rested exclusively upon that proposition. Irrespective of any claim of property, the right which inhered in the plaintiff as the decedent’s widow, and in one sense his nearest relative, was a right to the possession of the body for the purpose of burying it,—that is, to perform a duty which the law required some one to perform, and which it was her right, by reason of her relationship to the decedent, to perform. That right of possession is a clear legal right, and to use the language of Mr. Ruggles, in his valuable report, adopted by the court, in the Brick Church case,¹ ‘the right to bury a corpse, and to preserve its remains, is a legal right which the courts of law will recognize and protect.’ The right is to the possession of the corpse in the same condition it was when death supervened. It is the right to what remains when breath leaves the body, and not merely to such a hacked, hewed, and mutilated corpse as some stranger—an offender against the criminal law—may choose to turn over to an afflicted relative. If this right exists, as we think it clearly does, the invasion or violation of it furnishes a ground for a civil action for damages. It is not a mere idle utterance, but a substantial legal principle, that wherever a real right is violated a real remedy is afforded by law. A right to vote can in no sense be called a pure right of property; it is merely a personal right; yet who would now contend that a person obstructing a voter’s right, or preventing his voting, would not be, irrespective of any statutory enactment, liable, even if the candidate of the choice of the person thus obstructed was elected? Although the precise question involved in this case has not been judicially passed upon, so far as we have been able to ascertain, in the courts of this State, yet it has been decided in favor of the maintenance of the action by the Supreme Court of Minnesota in the case of *Larson vs. Chase*.² In the well-considered and well-reasoned opinion of the court in that case, it was held that the right to the possession of a dead body for the purposes of preservation and burial is a legal right,—one which the law recognizes and protects,—and that the violation of that right by an unauthorized and unlawful mutilation of the corpse before burial gives right to an action for damages in favor of the surviving wife of the deceased. It is there also held that the rule of damages would allow a recovery for mental suffering and for injury to the feelings occasioned directly by the unlawful mutilation, and that although no actual pecuniary loss or damage was proven. It is not for us,

¹ 4 Bradf. (Surr.) 532.

² 50 N. W. Rep. 238.

at this time, to express any opinion with respect to the measure of damages in a case of this kind ; but we are satisfied that the action will lie, and will lie in favor of the widow, under the circumstances disclosed by this complaint."

BOOK REVIEWS.

EYESIGHT AND SCHOOL LIFE. By Simeon Snell, F.R.C.S. (Edin.), Ophthalmic Surgeon to the Sheffield General Infirmary and to the School for the Blind; Lecturer on Diseases of the Eye at the Sheffield Medical School; Consulting Ophthalmic Surgeon to the Rotherham Hospital. Author of "The Electromagnet in Ophthalmic Surgery," "Miner's Nystagmus," etc. 8vo, pp. 70. Bristol: John Wright & Co., 1895. Price, 2s. 6d.

A book of this nature, more especially intended for the layman, should be read most carefully and conscientiously by every medical man to whom such questions are daily put. Stripped of all technicality, concise in statement, and most reasonable in price, its good purpose must necessarily be broadly felt. Standing alone in the English language as a separated and conjoined monograph upon this important topic, and written and arranged by one who has had all the advantages of extended research and actual experience, it cannot fail to exert its good influence upon those who have the decision of such matters as it deals with, in their hands.

Parents, guardians, teachers, school-boards, and, in fact, educators of all sorts, once having thoroughly grasped and appreciated the lessons inculcated in its pages, will thus be rendered more authoritative in the questions of school architecture, window-lighting, the relation of the desk to the pupil, the style of writing, the printing of books, the terms of study, recreation, etc., that at present are so uncertain in any but the newest and most modern school systems; whilst medical men who either pursue the practice of medicine in a broad, general way, or limit themselves to the special branch dealt with in this volume, will not infrequently find subject-matter that is new and useful, and see much with which to refresh their memories, thus rendering them more fully conversant with the subject at large, and hence better able to decide the higher grades of questions that necessarily must be given to them for judgment.

C. A. O.

AN ATLAS OF THE NORMAL AND PATHOLOGICAL NERVOUS SYSTEMS. By Dr. Christfried Jakob. Translated by Joseph Collins, M.D. New York: William Wood & Co., 1896.

This work by Dr. Jakob is a welcome addition to the anatomy of the nervous system. The introduction, from the pen of Professor Strümpell, is sufficient guarantee of the care observed in the preparation of the book. The first half of the volume is devoted to illustrations with brief explanatory notes, the second half comprises the text proper. There are a few plates with movable segments representing different levels of the brain. Most of the illustrations deserve unqualified approval; a few might be improved, for example, those showing ganglion-cells stained by the method of Nissl, in which the axis-cylinders seem to contain chromatophilic elements. Dr. Collins deserves credit for the careful translation, which, however, would not have suffered if he had followed the German less closely. In a few places style has been

sacrificed, as he himself says. Meynert's term *Gehirnstamm* is well rendered by brain-stem, though cerebral axis could also have been employed. Lateral ground bundle seems to be the usually employed translation for the German term.

The text is clear and contains only the best-known facts; theories are largely avoided, to the extent that in some places the language becomes dogmatic, a fault almost impossible to avoid in a book of this size on such a subject. *Tænia semicircularis* is a term not usually applied to the band of fibres passing along the upper and inner edge of the thalamus, and the statement that the lower halves of the thalami unite may be questioned. The use of the words *cullulifugal* and *cullulipetal* is to be commended; they should become as familiar in English as they now are in French and German. It is questionable if there exists a neuron anastomosis between protoplasmic prolongations. The description of the sensory tract within the brain corresponds with the views of prominent authorities, but would be disputed by others. The course described for the cochlear nerve within the medulla leaves us in some doubt as to what is meant. It would have been wise if the statement had been made that some prominent neurologists deny the existence of a centre for writing and of fibres in the lateral bundle of the peduncle from the occipital lobe.

No matter how carefully written a work on neurology may be, it must call forth difference of opinion, especially if the whole subject is crowded into a volume of this limited size, and we admire the ability Dr. Jakob has shown to do this so successfully. The book is a useful one for the student and the plates are serviceable.

W. G. S.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY. Edited by George M. Gould. Philadelphia: W. B. Saunders, 1896. For sale by subscription only.

In criticising such a complex work as this, it is not possible to give each man credit for his success in attaining the standard that he has set for himself, for each is only too likely to hold some peculiar views, and the resulting product will lack that harmony desirable in a single volume. And it is concerning this lack of harmony that we would make our first complaint. The editor has not sufficiently asserted his authority, and there is far too much variety of method. Had he been more emphatic, we are sure that the section upon otology would have been rewritten before insertion. When the physician in charge of the section declares that he intends to omit mention of such articles as do not accord with his own opinions, one suspects that he has never been informed of the purpose of the Year-Book; and when the text is found to be thickly interspersed with his personal views, one realizes that he has failed to appreciate the fact that he is writing a review of current literature, and not a text-book. *En passant*, it is perhaps permissible to notice the bad taste displayed in quoting an article of his own, written fourteen years ago. The intrusion of the personal views of the writer is noticeable also in the section on surgery, although here, as indeed is true of the section upon otology, the comment is often excellent. In the other articles it is always kept within proper bounds and is elucidative rather than critical. Two faults, serious enough, but in such a work unavoidable, are repetition and omission. The editor has control only of the former, and he has minimized it with great success. The only glaring instance is the description of sporadic cretinism in the sections upon pediatrics and neurology.

As for the latter, completeness was neither possible nor desirable, but the proportionate number of references differs so widely in the various articles that we suspect some of the writers to have been diffuse rather than industrious. Thus, the space covered by the section upon surgery exceeds that covered by the section upon medicine, yet the references are barely half as numerous. But the most flagrant case of omission is to be found in the article upon clinical chemistry. Three and one-half pages are devoted to this exceedingly important branch, wherein a few articles are quoted, all from English or American publications, one of these being

itself an abstract; while the vast amount of valuable work done by the Germans and the very considerable work done by the French have been absolutely ignored, not to mention the numerous important American and English papers that have been overlooked. This section may be considered the one serious blemish of the book.

The admirable features are many, the sections upon medicine, pediatrics, rhinology, therapeutics, and pathology are all that could be desired, nor are the other important sections noticeably inferior. The descriptions of the new operations in the section upon surgery are models of clearness and completeness, evidently from the pen of a master in this branch. In the section upon pediatrics the subject of the treatment of diphtheria with antitoxin is amply discussed; and in the section upon pathology all the modern theories of immunity are given. The editor's share is ably performed. The space is, on the whole, very well divided, the index complete and at the same time compact. Certain peculiarities of spelling are noticeable throughout the work, some of which seem to be efforts toward a more rational system of English orthography. *Résumé* should never be printed without the accents; if an English word is desired, *summary* almost fills its place. We should like to know what is meant by the statement that there was a fraction over twenty-nine cases of triplets in the whole number of births in Philadelphia during a certain period. The publishers deserve praise for their enterprise in getting up the book, and for the excellent paper, typography, and the substantial binding with which they have furnished it. The Year-Book is perhaps the most practical and valuable American contribution to annual literature.

J. S.

AN AMERICAN TEXT-BOOK OF SURGERY, FOR PRACTITIONERS AND STUDENTS.

Edited by W. W. Keen, M.D., LL.D., and J. William White, M.D., Ph.D.
Pp. 1213. Second edition. Carefully revised. Philadelphia: W. B. Saunders, 1895.

A text-book which has sold rapidly, has been adopted, as the preface states, in over sixty medical colleges, etc., and passed to a second edition within three years, would certainly seem to be above criticism. Such success does demonstrate the inherent value of the work and the literary acumen of the associated authors, but, unfortunately, the very success invites criticism, especially as it is asserted that this volume has been "carefully revised."

We note, page 3, "It is well known that syphilis may be acquired through both the semen and the placenta." P. 137, "There are no reliable cases of syphilitic contagion by the spermatic fluid." "Koch's remedy, which is at present attracting so much attention," is a statement veritable three years ago, but not now.

In the chapter on syphilis, under classification of syphilitic eruptions, there is no separate mention of *vesicles*, a very large and important division; and, p. 71, the student is directed to prescribe sixty pills of hydrarg. iodid. virid., . . . and, if these disagree, one-twentieth to one-twelfth grain of opium (no preparation named) is to be added to each pill. The result upon the digestive tract of following such loosely given advice is obvious, to say nothing of the chance of cultivating the opium habit. Some of the definitions are extremely poor. P. 277, "A simple fracture is one that is not compound." "A sprain fracture is a fracture of a part of the articular surface." "A sprain is a temporary displacement followed immediately by a return to place." Pott's fracture is not described clearly. We are advised (p. 295), in a "compound fracture, after anæsthetizing the patient, to purify [?] the wound, . . . the reduction of the fragments being of secondary importance, . . . for a final readjustment can usually be made in the *second or third week*."

No notice is taken of atrophy of the caput femoris following a fall upon the trochanter as the inciting cause of some of the suits for malpractice mentioned

(p. 317). Just seventeen lines are devoted to fractures of the tibia and of both bones of the leg and their treatment. No distinction is made between true and false ankylosis, and in dislocations there is no mention of the important "Dugas sign," nor of Sir Astley Cooper's method of reduction of the head of the humerus.

Under appendicitis the advice as to the use of opium is not sufficiently guarded, and the much-discussed subject, "*when to operate*," is skilfully avoided. The chapter on head injuries is unsatisfactory from a want of conciseness of statement. Chiene's method is badly described (there is a slight error in the lettering of the diagram); the mode of determining counterpoint for trephining is not clear. Reed's methods are dismissed with a diagram, and the diagnosis of brain tumor from brain abscess is indefinitely, though copiously, discussed. P. 795, Littré's and Richter's hernias are confused. The diagnosis of congenital hernia is declared to rest upon its occurrence at birth or soon after, which is incorrect. P. 873, the second stage of gonorrhœa is called the "*stationary stage*," which is *mal apropos*, because, though the symptoms are stationary,—i.e., so bad they can't get any worse,—yet the disease at this very time is extending backward; and, although considerable space is devoted to the treatment, yet the prescriptions are not put in the logical sequence for use. P. 1103, the permanganate of potassium method, called "*Kelly's*," was known before Kelly's time.

P. 1140, superior thyroid artery is said *invariably* to arise from the external carotid, which is untrue, and "the lingual veins to accompany the lingual artery," also untrue.

P. 1146, the right common iliac artery is declared to be the longer, "because the two common iliac veins join to form the vena cava."

P. 1149, in the ligation of the external iliac artery the *spermatic cord* is said to be out of reach,—and so it is (vas deferens?). Under local anæsthesia no mention is made of the infiltration method. The new additions to this edition consist mainly of sections upon acromegaly, symphyseotomy, the Hartley-Krause method for removal of the Gasserian ganglion, a very safe and conservative discussion of castration for enlarged prostate, with a number of additions upon the surgery of the head, spine, chest, and abdomen.

The chapters upon fractures and dislocations, hernia, diseases of the breast, and gynaecology have been enlarged and new illustrations added. We hope in subsequent editions to see the chapters on injuries of the head and of the abdomen thoroughly remodelled and condensed, that on fractures improved, the sections on traumatic fevers, septicæmia, and pyæmia put in one chapter, and their distinctions brought out more clearly, and certain subjects, like laryngitis, omitted all together. The faults of the work could easily have been corrected with a little care. We must not forget, however, that it was written with the view of being used as a text-book in conjunction with the didactic or clinical teaching of the authors at the various colleges.

It would add greatly to its value as a text-book if the language were more terse and the discussions more condensed. The deficiencies, though often annoying, are, many of them, of detail, not of principle, and, barring these, the book is a valuable *résumé* of the surgical art as it stands to-day,—fairly exhaustive, practical, and useful, and, while rather verbose, is a valuable addition to our surgical library.

E. W. H.

DISORDERS OF THE MALE SEXUAL ORGANS. By Eugene Fuller, M.D., Instructor in Venereal and Genito-Urinary Diseases, New York Post-Graduate Medical School. Philadelphia: Lea Brothers & Co., 1895. One volume, 8vo, pp. 238, with numerous plates and cuts.

The title of this book is too comprehensive and is, in fact, a misnomer, and while it misleads the public, it does injustice to the author, who has with great labor and

study prepared a concise and comprehensive treatise on the disorders of the seminal vesicles.

The plates, though well executed, are most difficult and tedious of access, requiring the turning of many leaves to find their explanation, a fault which the publisher might easily have avoided by the addition of an explanatory table to each.

The book has the rare merit of containing an appreciable amount of original thought, experience, and labor, with only a necessary amount of compilation. It is an addition to our knowledge of the anatomy, pathology, and treatment of this particular portion of the male sexual organs.

C. L. L.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS, WITH ESPECIAL REFERENCE TO THE APPLICATION OF REMEDIAL MEASURES TO DISEASE AND THEIR EMPLOYMENT UPON A RATIONAL BASIS. By Hobart A. Hare, M.D., B.Sc., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia, etc. Fifth Edition, enlarged and thoroughly revised. Philadelphia: Lea Brothers & Co., 1895.

This is the fifth edition, in as many years, of this well-known text-book. Rather more than half of the volume is occupied by a concise description of the physiological and therapeutical action of the various drugs, including all the newly-introduced ones of any importance. Remedial measures other than drugs form a carefully-written and important chapter. In the last third of the volume the therapy of the various diseases, taken alphabetically, is discussed, and the indications for the administration of the several drugs clearly explained.

The original *raison d'être* for this volume may be stated in the words of the author: the treatment of symptoms as they arise, by the employment of remedies recommended by some eminent authority, is a variety of empiricism whose existence has depended largely on the fact that many physicians of the past have either been so ignorant as to be led where a writer willed, or so slothful as to be willing to let others think for them. Scientific research has opened up to every one the possibility of using drugs with a distinct idea of the reason for their employment. The writer has endeavored in this work to bring together in a readable form the combined results of laboratory and bedside experience.

That a new edition has been called for each successive year is an emphatic assertion from the public that the writer has succeeded in his task; this result was to be expected. Dr. Hare is well known as a careful experimental pharmacologist, as well as an able physician; and in few works is the physiological action of the several drugs so lucidly and yet so succinctly stated as in this volume.

His remarks on therapeutics are clearly stated and extremely practical.

A. D. B.

A PRACTICAL TREATISE ON MATERIA MEDICA AND THERAPEUTICS, WITH ESPECIAL REFERENCE TO THE CLINICAL APPLICATION OF DRUGS. By John V. Shoemaker, M.D., LL.D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine in the Medico-Chirurgical College of Philadelphia, etc. Third Edition. Thoroughly revised. Philadelphia: The F. A. Davis Company, 1895.

This volume of Professor Shoemaker's is a large and comprehensive work of over 1100 pages. Formerly issued in two volumes, it has been thought more convenient in this edition to have the two combined in one. The author tells us in the preface that he has inserted an account of all the important later additions to our materia medica, and added much new matter in connection with many of the less-recently-introduced drugs. Treatment by means of animal extracts and immunized serum receives attention in a carefully-written article. The chapters on Electro-

therapeutics, Massage and the Rest Cure, Pneumotherapy, Hydrotherapy, Climatotherapy, the Application of Heat and Cold and of Hypnotism in the Treatment of Diseases, are excellent and practical *résumés* of our knowledge in their respective subjects. Having referred to this work frequently and extensively during the past few weeks, we note the large number of non-official drugs which receive more or less attention from the author; of recently-introduced drugs, all appear to have been noticed, and abstracts made of the various therapeutic properties claimed for them. In the remarks on the pharmacology of the various drugs, it would have occupied little space, and been of much practical advantage to the physician, to have stated exactly the solubility of the various drugs and soluble salts. We regret that, in speaking of the therapeutic action of the drugs, sufficient care, in our opinion, has not been taken to eliminate much that is worthless, and that, in the plenitude of his details, his grouping of facts is so faulty. The numerous quotations which are made from all recent writings contain many statements which can scarcely be said to represent the teaching given in our schools to-day. The same remark may be made of the prescriptions which abound on almost every page. We are surprised to note the very compound character of almost all of them. We had hoped that the present teaching in our better schools tended to simplicity.

We have no doubt, however, that this book, with its plethora of facts, will prove very serviceable to the busy physician. In its present form we do not regard it as so suitable for the student.

A. D. B.

THE POCKET MATERIA MEDICA AND THERAPEUTICS. A *Résumé* of the Action and Doses of all Official and Non-Official Drugs now in Common Use. By C. Henri Leonard, A.M., M.D. Second Edition, Revised and Enlarged. 1895. Detroit: The Illustrated Medical Journal Company.

This is a small closely-printed manual containing brief notes on all drugs which are in use at present. After the Latin name of the drug follows the termination of the genitive case. English, French, and German synonymes are stated. The habitat of the drug, the part used, and a description of its appearance follow. Its therapeutic uses, its synergists and the drugs incompatible with it, its dose, and the various official preparations made from it are all exactly but very concisely given. It has been written to serve as a ready-reference book in small compass; and it will doubtless fill a useful niche. Much care seems to have been exercised in its preparation.

A. D. B.

PATHOLOGY AND TREATMENT OF VENEREAL DISEASES. By Robert W. Taylor, M.D. Philadelphia: Lea Brothers & Co., 1895.

The author in the present work has combined his very extensive personal experience with that of other competent observers, and has produced a treatise upon venereal diseases which may be accepted as a standard of the most modern views upon this subject. The introductory chapter, tracing the evolution of our knowledge upon these subjects from the earliest times to Ricord's important differentiation between gonorrhœa and syphilis, and the later controversies of the unicists and dualists, is most interesting.

The author clearly points out the importance of pathological and bacteriological investigations in the study of venereal diseases. The subject of the gonococcus and its characteristic pathogenic action and its relationship to gonorrhœa is fully considered, although the author is not a strict adherent to the school of Neisser. While admitting that the gonococcus may be responsible for many cases of gonorrhœa, he points out the fact, substantiated by many other careful observers, that other micro-organisms are at times the active agents in producing this affection, and is of the opinion that a more careful and extended study of the bacteriology of the genitalia must be undertaken before the matter can be considered definitely settled.

The pathology of stricture is exhaustively considered, and the importance of a careful study of the normal urethra is clearly shown. The author is not a friend of indiscriminate cutting and over-distention in the treatment of this affection, and his views upon stricture of large calibre cannot fail to meet the approval of judicious surgeons.

In discussing the etiology of chancroid the author recalls the fact that Dr. Bumstead and he were among the first to point out its now generally conceded non-specific origin.

The subject of syphilis is considered most exhaustively, and a special chapter upon syphilitic disease of the ear is introduced.

Throughout the volume the author, upon the question of treatment, is apt to express his views very dogmatically, but, as his experience has been most extensive, this, in our judgment, does not detract from the value of the work.

The book is well illustrated, many of the illustrations being original.

The work as a whole may be considered a very satisfactory exposition of the modern pathology and treatment of venereal diseases, and as such we are sure it will find favor with the profession.

CLINICAL LECTURES ON DISEASES OF THE NERVOUS SYSTEM. Delivered at the National Hospital for the Paralyzed and Epileptic, London. By W. R. Gowers, M.D., F.R.S. Philadelphia: P. Blakiston, Son & Co., 1895.

The medical public is certainly under great obligations to Dr. Gowers for having collected these valuable lectures and published them in book form. It takes but a glance at the pages to reveal their great practical value, in that they do not consist merely of bald descriptions and clinical details, but they are replete with the very best advice. It would be difficult to conceive, for instance, of a lecture more directly useful to a student or practitioner than the opening one on the Principles of the Diagnosis of Diseases of the Nervous System. After dwelling upon the ordinary method of making a diagnosis,—namely, by forcing a case to conform to this or that “type” of disease,—and pointing out its insufficiency and the danger of error, he gives this most valuable instruction:

“Whenever you find yourself in the presence of a case that is not at once and completely familiar to you in all its details, forget for the time all your types and all your names. Deal with the case as one that has never been seen before, and work it out as a new problem, *sui generis*, to be investigated as such. Observe each symptom carefully, and consider its significance. Then put the several symptoms together, and consider the meaning of their combination, especially whether there is any one part of the nervous system at which disease might cause them all. Lastly, consider the way they came on, as indicating the nature of the lesion, comparing this with the evidence of their seat, and remembering also that their character may in itself tell you something of their probable nature.”

Another valuable lesson may be learned from Lecture II., on Mistaken Diagnosis, in which this famous teacher uses one of his own errors as an illustration and does so in a most interesting manner.

The other lectures embrace such subjects as Syphilis, Bulbar and Facial Paralysis, Locomotor Ataxia, Syringomyelia, Neuralgia, and Optic Neuritis, and they are most interesting as revealing the methods of instruction pursued by Dr. Gowers. Every important point is dwelt upon,—the possible significance of the various symptoms is considered in detail as is also the general application of the knowledge gained. Not only students and practitioners but the teachers of clinical medicine themselves will find the perusal of these lectures of the utmost benefit.

F. X. D.

COLOR-VISION AND COLOR-BLINDNESS. A Practical Manual for Railroad Surgeons. By J. Ellis Jennings, M.D. (Univ. Penna.), Lecturer on Ophthalmoscopy and Chief of the Eye Clinic in the Beaumont Hospital Medical College, etc. Illustrated with 1 colored full-page plate and 21 photo-engravings. Crown octavo, 110 pages. Cloth, \$1.00 net. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

The author of this little manual for railroad surgeons has chosen a most opportune time to send forth this appeal to those who have control of the life and the safety of the travelling public.

The preliminary portion of the volume gives just sufficient data as regards the historical facts of the condition, the physiological anatomy of the retina, the physics of light, color-sensations, and the theories of normal and subnormal color-perception, to prepare the reader for a proper understanding of the more important practical side of the subject.

The lessons as to the various methods of detection of subnormal perception are well told in the remaining chapter. Without bias as to any one method or invidious assertion of superiority of one plan over another, the many excellent tests with their varying degrees of usefulness are dealt with in a candid and a frank manner by separating the good from the bad, the applicable from the non-applicable, and the easy from the difficult in each. In other words, there is given in the book's few pages an excellent epitome of that which is most practical for those who wish to work quickly and properly in such matters.

For the proposed medical readers and workers, the railway surgeons, for whom this little book is intended, the reviewer—a practical worker in such directions himself—unhesitatingly asks them to peruse its pages carefully from beginning to end before beginning to take up the subject any further, and before outlining or evolving any new plans that may seem to them for the best interests of any section of travel that may be under their jurisdiction.

C. A. O.

BOOKS RECEIVED.

J. B. LIPPINCOTT COMPANY, PHILADELPHIA.

INTERNATIONAL CLINICS. Volume iv. Fifth Series. January, 1896.

REPORTS OF SOCIETIES.

TRANSACTIONS OF THE MEDICAL SOCIETY OF NORTH CAROLINA.

TRANSACTIONS OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA. Third Series. Volume xviii.

JOHNS HOPKINS PRESS, BALTIMORE.

JOHNS HOPKINS REPORTS. Volume v.

W. B. SAUNDERS, PHILADELPHIA.

MANUAL OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By Henry C. Chapman, M.D.

F. A. DAVIS CO., PHILADELPHIA.

SYPHILIS IN THE MIDDLE AGES AND IN MODERN TIMES. By Dr. F. Buret. Translated by A. H. Ohmann-Dumesnil.

PRACTICAL URANALYSIS AND URINARY DIAGNOSIS. Second edition. By C. W. Purdy.

M. L. HOLBROOK & CO.

PHYSICAL, INTELLECTUAL, AND MORAL ADVANTAGES OF CHASTITY. By Dr. M. L. Holbrook.

LEDGER, SMITH & CO., LONDON.

THE MEDICAL DIGEST. Appendix to August, 1895. By Richard Neale, M.D.

WILLIAM WOOD & CO., NEW YORK CITY.

MEDICAL JURISPRUDENCE, FORENSIC MEDICINE, AND TOXICOLOGY. Volume iii
 Edited by R. A. Willhaus, A.M., M.D., and Tracy C. Becker, A.B., LL.B.
 Well illustrated. Translated by Joseph Collins, M.D.

LEA BROTHERS & CO., PHILADELPHIA.

THE YEAR-BOOK OF TREATMENT FOR 1896.

APPENDIX TO DUNGLISON'S MEDICAL DICTIONARY. Twenty-first edition.

AMERICAN MEDICAL PRESS, NEW YORK.

THE HISTORY OF PROSTITUTION. By William W. Sanger, M.D.

ITEMS OF INTEREST.

The Third International Congress of Dermatology will be held in London, on August 4 to 8, 1896. The programme is an interesting one, papers being promised by many distinguished dermatologists, as Kaposi, of Vienna; Unna, of Hamburg; Fournier and Hallopeau, of Paris; Hutchinson, of London; Campana, of Rome; Neisser, of Breslau; and Morrow, of New York. The Congress has secured for its use the building known as Examination Hall, on the Victoria Embankment. This will afford every facility for all kinds of demonstrations; cases, pictures, museum, etc. Special efforts are being made to have large clinical demonstrations of cases, and all who have been in London know how rich is the material there. Those intending to join the Congress should notify the secretary, Dr. J. J. Pringle, 23 Lower Seymour Street, W., London, of their intention as soon as possible. The membership fee is \$5.00. Dr. George Thomas Jackson, of 14 E. Thirty-first Street, New York, is the secretary for the United States.

The following interesting clipping has been going the rounds of the daily press:

What our Presidents died from. 1. George Washington died from a cold which brought on laryngitis; buried on his estate at Mount Vernon, Va.

2. John Adams died from senile debility; buried at Quincy, Mass.

3. Thomas Jefferson died of chronic diarrhoea; buried on his estate at Monticello, Va.

4. James Madison died of old age; buried on his estate at Montpelier, Va.
 5. James Monroe died of general debility; buried in Marble Cemetery, New York City.
 6. John Quincy Adams died of paralysis, the fatal attack overtaking him in the House of Representatives; buried at Quincy, Mass.
 7. Andrew Jackson died of consumption and dropsy; buried on his estate, the Hermitage, near Nashville, Tenn.
 8. Martin Van Buren died of catarrh of the throat and lungs; buried at Kinderhook, N. Y.
 9. William Henry Harrison died of pleurisy, induced by a cold taken on the day of his inauguration; buried near North Bend, Ohio.
 10. John Tyler died from a mysterious disorder like a bilious attack; buried at Richmond, Va.
 11. James K. Polk died from weakness, caused by cholera; buried on his estate in Nashville, Tenn.
 12. Zachary Taylor died from cholera morbus, induced by improper diet; buried on his estate near Louisville, Ky.
 13. Millard Fillmore died from paralysis; buried in Forest Hill Cemetery, Buffalo, New York.
 14. Franklin Pierce died from inflammation of the stomach; buried at Concord, N. H.
 15. James Buchanan died of rheumatism and gout; buried near Lancaster, Pa.
 16. Abraham Lincoln, assassinated by J. Wilkes Booth; buried at Springfield, Ill.
 17. Andrew Johnson died from paralysis; buried at Greenville, Tenn.
 18. Ulysses S. Grant died from cancer of the throat; buried at Riverside Park, New York City.
 19. Rutherford B. Hayes died from paralysis of the heart; buried at Fremont, Ohio.
 20. James A. Garfield, assassinated by Charles J. Guiteau; buried at Cleveland, Ohio.
 21. Chester A. Arthur died from Bright's disease; buried in Rural Cemetery, Albany, New York.
- This leaves Benjamin Harrison the only living ex-President.

The co-operation of the medical profession is solicited in the movement now in progress to erect a monument to the late Wilhelm Meyer, by whose death the profession has lost a brilliant, useful, and greatly appreciated member, and the world at large one of the leading and most practical philanthropists of the time.

Professor Meyer's distinguished service to humanity in the recognition of the condition known as adenoid hypertrophy at the vault of the pharynx,

William Meyer
Memorial.

and in the efficient means devised by him for its cure, will doubtless, as it should, awaken a ready and liberal response not only from many sufferers to whom this great man brought relief, but from all sympathizers in the advanced work of the true physician. It is proposed to erect in Copenhagen, Professor Meyer's native city, a monument to his memory, and for this purpose committees have been formed in the principal countries of Europe to forward the work. A large and influential committee has been appointed in this country, and it is hoped that all who have profited by the results of Professor Meyer's teaching, even among the laity, will aid in this commendable work. Contributions may be sent either to Dr. Bryson Delavan, 1 East Thirty-third Street, New York City, or to the Philadelphia representative, Dr. Harrison Allen, 1933 Chestnut Street.

The early announcement is made that the Faculty of Harvard Medical School have decided to follow the example of Johns Hopkins University and require a degree for admission for those intending to pursue the study of medicine in that institution. The following resolution¹ was passed last January: "On and after June, 1901, candidates for admission to the Medical School must present a degree in arts, literature, philosophy, science, or medicine from a recognized college or scientific school, with the exception of such persons, of suitable age and attainments, as may be admitted by a special vote of the Faculty taken in each case. All candidates, whether presenting a degree or not, are and will be required to satisfy the Faculty that they have had a course in theoretical and descriptive (inorganic) chemistry and qualitative analysis, sufficient to fit them to pursue the courses in chemistry given at the Medical School." The number of students attending the present session and having such a degree is about forty per cent. This shows a considerable increase over the 28.2 per cent. in the year 1892. The maximum of 53.9 per cent. was reached in the year 1884.

A Degree to be
required for Ad-
mission to the
Harvard Medi-
cal School in
1901.

¹ Boston Medical and Surgical Journal, January 9, 1896.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

JUNE, 1896.

[No. 5.

ORIGINAL COMMUNICATIONS.

PROGRESS IN RADIOGRAPHY.

BY ARTHUR W. GOODSPEED, Ph.D.,

Assistant Professor of Physics in the University of Pennsylvania.

FOR the last ten weeks in the Physical Laboratory of the University of Pennsylvania, we have been paying especial attention to a reduction in the time of exposure necessary to produce clear and sharp pictures of the living human skeleton. That this was exceedingly desirable appears from the fact that not long ago it was necessary to make an exposure of from thirty minutes to one hour in order to produce a really good picture of the metacarpal bones. In most of the cases where it would be necessary to apply this method to surgical diagnosis, such a length of exposure would prove almost prohibitory, for obvious reasons. The shortest exposure that the writer has attempted was four and one-half seconds, by which, on April 20, a perfectly clear and sharp negative of the wrist and bones of the forearm was produced.

This successful reduction in the time of exposure has been accomplished by improvements in the arrangement of the exciting apparatus, in the form of Crookes' tube employed, and lastly, but by no means of least importance, in the development of a specially sensitized photographic plate. In seeking the best plate, the attention of the writer was called by Mr. Sachse, of Philadelphia, to the very thick coating found upon some imported German plates made by Schleussner, of Frankfurt-am-Main. It was also evident that the early negatives produced by the Germans were far denser than any made in this country. With a view to developing the sensitive plate to produce the best results possible, Mr. John Carbutt has given untiring attention and made many experiments. Most of the Carbutt plates have been tested by the writer in comparison with other makes, and those now

in use give by far the best results of any yet tried. The negatives from which the illustrations accompanying this article have been reproduced are samples of the plates referred to.

No. 1 is the picture of the wrist of a middle-aged lady, who consulted Dr. Ashhurst at the University Hospital in regard to a possible operation. This lady twenty years ago received nearly a full charge of shot from a gun that was accidentally discharged by her nephew. Without the aid of the radiograph only six shot could be felt through the skin. The radiograph shows over thirty to be present.

No. 2 presents a very interesting case. A boy ten years of age, living in Germantown, has had a sore and at times a much inflamed foot since last August. His physician, Dr. Müller, advised that a radiograph might be useful in determining whether the presence of a foreign body was the cause of the trouble. Such was suspected though nothing was known. The picture speaks for itself, and is so sharp and distinct that even the eye of a good-sized needle is clearly visible in the negative. The plate was bound to the top of the foot and the tube was placed about ten inches opposite the sole. The exposure was only a few seconds. An operation was performed a few days ago, and the needle easily removed.

No. 3 is a radiograph of the skull. For this an 8 x 10 plate was bound to the side of the face, bearing against the cheek-bone and nose. The tube was placed about two feet away on a line perpendicular to the middle of the plate. The exposure was twenty minutes.

Nos. 4 and 5 are radiographs of the upper and lower portions of the trunk of a full-grown living subject. 16 x 20 plates were used, the subject lying flat upon his back upon the plate. The exposures were forty-five minutes each. Since making these negatives the time of exposure for such work has been very much reduced. In fact, on Monday evening, May 18, the writer, with his assistant, Mr. G. C. McKee, produced a negative fully equal in quality to the first with an exposure of only *one minute*. The coil used was made many years ago by Ritchie, of Boston, and is capable under favorable conditions of giving a spark sixteen inches long in air. The tube used is essentially a *focus tube*, but is of German make, and has been in the cabinet of the University a number of years. It has a platinum disk in the focus of a concave aluminum projector. The latter is made the cathode. The coil used by the writer for most of his experiments is an old-fashioned Ruhmkorff coil giving about a ten-inch spark in air. He has also used tubes made in this country by both Queen & Co., of this city, and Knott, of Boston, with good success.

No. 6 shows the hand of Dr. Packard's case of acromegaly.

BIBLIOGRAPHY.

(Articles by the Author on the Röntgen Phenomena.)

- I. Röntgen's Discovery. *Medical News*, February 15, 1896.
- II. Experiments in the Röntgen X-Rays. *Science*, February 14, 1896.



PLATE I.—Röntgen picture of the wrist, showing shot.





PLATE II.—Broken needle, showing eye, embedded in the dorsum of the right foot.



PLATE III.—Skiagraph of a normal skull. The nasal bones and the fillings in the teeth are well seen. The cervical vertebræ are distinguishable in the original, but barely so in the half-tone. (Reduced.)



PLATE IV.—Skiagraph of the normal trunk. The articulations at the shoulder-joint are beautifully shown. (Reduced.)

PLATE V.—Skiagraph of the normal male pelvis.





PLATE VI.—Dr. F. A. Packard's case of acromegaly ("Transactions of the College of Physicians," vol. xvi.), showing hyperostosis.

- III. Paper on the Röntgen Phenomena, read before the American Philosophical Society, February 21, 1896. *Proceedings of the Society*.
- IV. Röntgen's Discovery. Lecture before Alumni Association, Philadelphia College of Pharmacy. *Alumni Report*, March, 1896.
- V. The Röntgen Phenomena. *Science*, March, 1896.
- VI. Radiography and its Applications. *The Photographic Times*, June, 1896.
-

ON SKIAGRAPHY OF THE HEAD AND TRUNK.

BY W. W. KEEN, M.D.,

Professor of the Principles of Surgery and of Clinical Surgery in the Jefferson Medical College, Philadelphia.

I HAVE been asked by the editor of the MAGAZINE to make a few remarks on the very remarkable skiagraphs of the head and upper and lower trunk, of which plates are reproduced in this number of the INTERNATIONAL MEDICAL MAGAZINE.

Attempts have been made by Edison and others to skiagraph these thick parts of the body, but so far the pictures have been so obscure that no certain inferences could be drawn from them. Professor A. W. Goodspeed, of the University of Pennsylvania, however, has far eclipsed all others in these most beautifully clear skiagraphs. Unfortunately, though so well done, the reproductions are still inferior to the fine originals of the full size of the human body.

The skiagraph of the head (Plate 3) is taken with the mouth open. The teeth of the upper jaw show that the Crookes tube was below the level of the mouth, since it shows both the hither and the farther teeth perfectly well at different levels. For the same reason the outline of the inferior border of the lower jaw appears double, the lighter shadow (towards the lower border of the picture) being the farther side of the jaw, showing only one thickness of the bone, the darker shadow is caused by the superposition of the shadows of the hither and farther horizontal rami of the jaw. Any abnormalities of the jaw would have been easily seen, provided they were bony. The antrum, in spite of the fact that the antra of both sides are looked through, is remarkably translucent. The irregularities in translucency—that is to say, the streaks of darker shade—show the ridges and other thickenings of the bone in the antrum. Were any bony tumor present in either antrum, it would be seen. A sarcoma or other similar tumor would, of course, not betray its presence. The same remark applies to the orbit, which is unexpectedly translucent, and above it will be seen a light spot corresponding to the frontal sinus. The nasal bones show as a light shadow, and were mistaken by several persons who looked at the

picture in my presence for eyelashes, forgetful of the fact that the eyelashes would not show in the least.

The larynx is plainly perceptible, the thyroid cartilage being dense enough to throw a shadow slightly denser than that of the soft parts. I presume that the darker shadow at the upper border of the larynx is caused by the hyoid bone. Between it and the jaw is seen the slighter shadow of the muscles running upward from the hyoid bone. Any foreign body not permeable to the X-rays, such as a jack-stone, would be instantly detected in this portion of the body. It will be noticed, also (at least in the original), that the bodies and the spinous processes of the vertebræ show with moderate distinctness. Were there any tubercular abscess, fracture, or dislocation in this region, there would be but little difficulty in determining not only the fact, but the details of such a lesion.

The cranium is a blank. No variation of shadow appears excepting where the malar, zygoma, jaw, and mastoid unite in a rather confused mass in the centre of the picture.

It is but another illustration of the fact that there will probably be little if any possibility of skiagraphing the interior of the cranium. Should we be able hereafter to increase the power, especially the power of penetration of the rays, and increase their quantity as well as the sensitiveness of the photographic plate, it is possible that we may be able to do something with endocranial skiagraphy; but, at present, it is about the only region of the body still beyond our reach.

It will be observed that the bodies of the cervical vertebræ (Plate 4), even the cupping of their upper and lower surfaces, show with remarkable clearness, as also the intervertebral disks, and that if there were any disease of these bones,—for example, tubercle, producing a high Pott's disease,—it would be easy to determine the exact position of the lesion and the amount of destruction of the vertebræ. Were there a gunshot wound or a fracture-dislocation of the cervical region, every detail of it could be made out. In the dorsal region the shadows of the bodies of the vertebræ are indistinctly seen, being obscured to a considerable extent by the continuous shadow of the sternum. Even there, however, in the original skiagraph, the intervertebral substances show faintly, but yet positively. It will be observed, also, that in almost all of this portion of the spine, in front of which the trachea and œsophagus run in the middle line, if a foreign body, a metallic one at least, were lodged in either, it could be seen with distinctness. Very recently White (*University Medical Magazine*, June, 1896) has removed a jack-stone by tracheotomy, which was beautifully located by means of skiagraphy.

The posterior portions of the ribs are well seen, and, in view of their mobility, with extraordinary clearness of outline, though, of course, the posterior portion moves but slightly. It may be for this reason that the anterior portions do not show excepting in the first and second, and faintly in the third and fourth ribs. Of course, the cartilages of the ribs would

not cast any shadow. Were there a cervical rib, which, in a case demanding surgical interference, it would be of the greatest importance to know, this would be shown very readily. Even the articulations of the ribs with the bodies of the vertebræ in the cervical region show beautifully. In the plate this is not nearly so well seen as in the original skiagraph.

The clavicles are very distinct. Fracture, and especially "green-stick" fracture in a child, or any disease of the bone producing its enlargement or thickening would readily be seen. Dislocation of either end of the bone would be perfectly perceptible. The thicker parts of the scapula show very well, though the body of the scapula, by reason of its thinness, only casts a faint shadow. The spine of the scapula can be seen, and the coracoid process, so that fracture of the latter could be determined very readily. The acromion shows well, and I would specially call attention to the darkening of the shadows where the spine and the coracoid and the spine and the head of the humerus by their overlapping cause deeper shadows.

One of the most striking and valuable points of the skiagraph is the distinctness with which the shoulder joint is seen. Were there any erosions of the head of the humerus or of the glenoid cavity, for instance by tubercular disease, any enlargement of the shaft of the bone by central sarcoma, any abscess in the head or the shaft of the bone, ankylosis of the shoulder-joint, or in fact any form of disease which would change the outline of the bone or affect its permeability to the X-rays, they could be seen with startling distinctness. Fracture of the anatomical neck could be placed beyond doubt.

The skiagraph of the pelvis (Plate 5), though not so clear as that of the chest, is still an unexpectedly and extraordinarily good result. The bodies of the lumbar vertebræ are obscurely seen, and the same may be said of the sacrum, of which, in the original, the intervertebral substances can be faintly seen. The coccyx also shows.

One of the most important points to be observed about the skiagraph is that the upper opening of the pelvis is so clearly seen that a measurement could be made with absolute accuracy in order to determine whether a fœtus could be delivered or not in the case of a deformed pelvis. If the dimensions of the skiagraph should not be absolutely the same as those of the original pelvis, a proportionate allowance could be very readily made by measuring the distance between the crests of the ilia, which could be measured with accuracy on the body or taken as a standard. Any fracture or deformity of such a pelvis could be determined very readily. Osteosarcoma of the ilium, fracture, or any other disease or injury altering its outlines would be perfectly demonstrable. It is doubtful whether disease of the hip-joint itself could be made out from such a skiagraph; but fracture of the neck of the femur or of the greater tuberosity could be determined very readily.

I certainly congratulate Dr. Goodspeed on his remarkable skill and success in this new department, which in these particular cases I think

surpasses any results of European or other American experimenters. That skiagraphy has progressed so far as to enable us to obtain such remarkable results is most encouraging. Sixty or even thirty days ago such a result would have been impossible. The progress of the art, therefore, has been most rapid and satisfactory. Many of the details which are wanting in the present skiagraphs will unquestionably be supplied as a result of future improvements in our methods.

THE APPLICATION OF THE X-RAYS TO THE DIAGNOSIS OF MORTON'S PAINFUL AFFECTION OF THE FOOT, OR METATARSALGIA.

BY THOMAS G. MORTON, M.D.,

Senior Surgeon, Pennsylvania Hospital; President, Philadelphia Academy of Surgery.

IN the *American Journal of the Medical Sciences* for January, 1876, I called the attention of the profession to a peculiar painful affection of the fourth metatarso-phalangeal articulation. The disease in question was described as a painful affection of the plantar digital nerves, directly caused by pressure upon, or pinching, them or their articular branches, by certain portions of the fourth or fifth metatarso-phalangeal articulation.

The reason given for the fact that the fourth toe was the almost invariable seat of origin of the train of painful and neurotic symptoms was founded upon anatomical considerations. Attention was directed to the fact that the metatarso-phalangeal joints of the first, second, and third toes are found on almost a direct line with each other, while the head of the fourth metatarsal is from one-eighth to one-fourth of an inch behind the head of the third, and the head of the fifth is from three-eighths to half an inch behind the head of the fourth; the joint of the third, therefore, is slightly in advance of the joint of the fourth, and the joint of the fifth is considerably behind the joint of the fourth. The fifth metatarsal joint is so much posterior to the fourth that the base of the first phalanx of the little toe is brought on a line with the head and neck of the fourth metatarsal bone, the head of the fifth metatarsal being apposed to the neck of the fourth.

On account of the character of this peculiar tarsal articulation, there is very slight lateral motion in the first three metatarsal bones. The fourth has greater mobility, the fifth still more than the fourth, and in this respect it resembles the fifth metacarpal. Lateral pressure brings the head of the fifth metatarsal and the phalanx of the little toe into direct contact with the

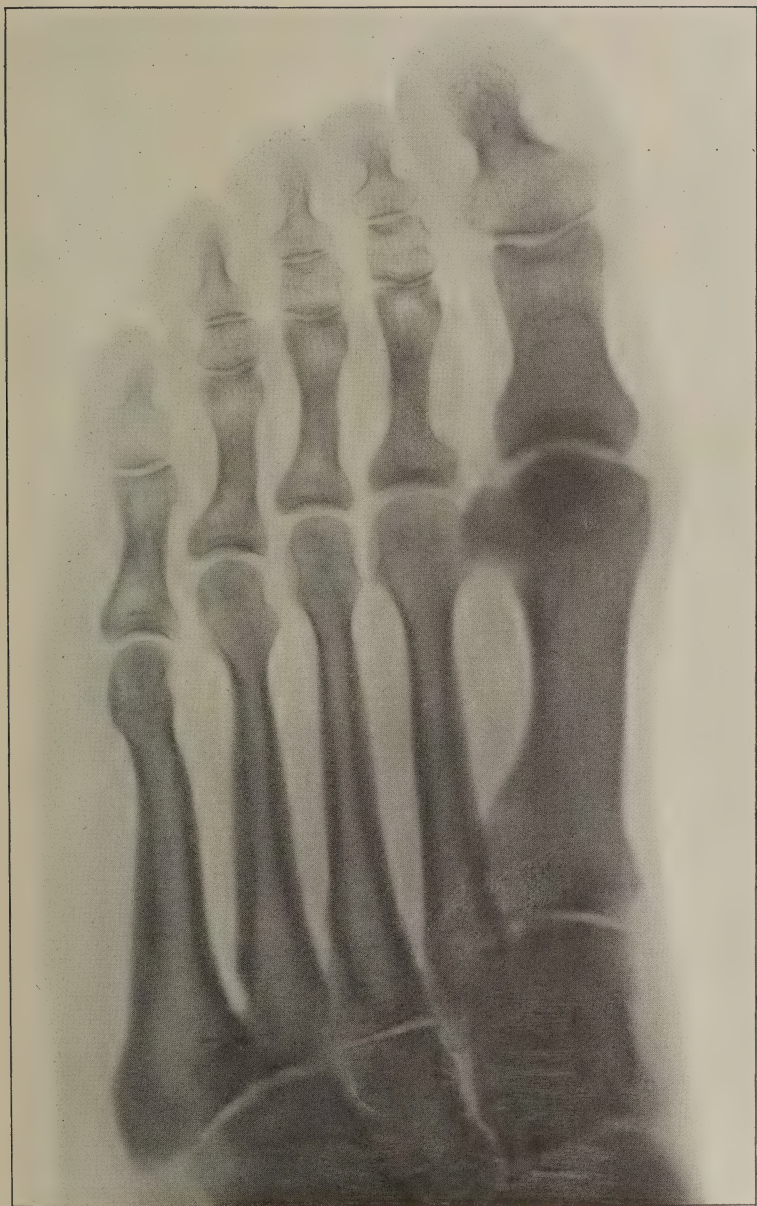


PLATE II.—Skiagraph of normal foot.



PLATE III.—Distortion of foot, showing deviation of phalanges; crowding of the third and fifth metatarsal bones upon the head of the fourth.

head and neck of the fourth metatarsal, and to some extent the extremity of the fifth metatarsal rolls above and under the fourth metatarsal.

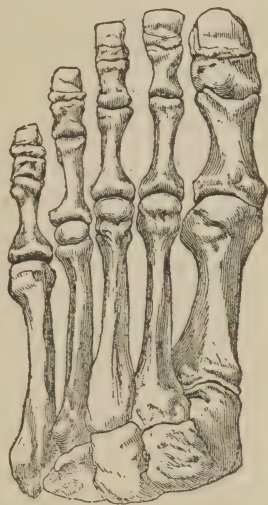
The mechanism of the affection now becomes apparent, when we consider the nerve-supply of the parts. The branches of the external plantar nerve are fully distributed to the little toe and to the outer side of the fourth; there are also numerous branches of this nerve deeply lodged in between these toes, and they are liable not only to be unduly compressed, but pinched by a sudden twist of the anterior part of the foot. Any foot movement which may suddenly displace the toe, when confined in a shoe, may induce an attack of this neuralgia. In no instance has any abnormality or other specific cause for the disease been detected.

I have not seen occasion, in the twenty years since the above explanation of the disease was given, to modify or change my views as to its pathology.

I shall present briefly the clinical histories of three hitherto unpublished cases of this peculiar neuralgia of the foot, or "metatarsalgia," as it has been more recently called, and invite a comparison of the illustration made from a dissection of a foot, which appeared in my former communications upon this subject (Plate I.), and of the results obtained in a skiagraph of a normal foot; and also of the results obtained by submitting two patients actually suffering with this condition to the test of the X-rays, recently introduced by Professor Röntgen, and again of the two skiagraphs, one of a foot operated upon some years ago, and another of the normal foot of the same individual.

The skiagraphs were made for me by Professor Goodspeed, of the University of Pennsylvania. The details of the method are familiar and need not be described, beyond mentioning the fact that the photographic plate was affixed to the dorsum of the foot, while the sole was exposed to the rays; the time of exposure varied from twenty-three seconds to two minutes and twenty-five seconds. I wish to direct attention to the peculiar distortion of the phalanges which is seen in Plates III., IV., and V., admirably shown in each of the pictures, which are the first that have been taken during life, and which would seem to furnish, with the history of neuralgia, clear indication for operation. The fact that the metatarso-phalangeal joints of the first three toes are on a level, as shown in my original diagram, is also fully demonstrated in the skiagraph of the normal foot, herewith exhibited for the purpose of contrast with the others. The histories of these typical cases were written by the patients themselves:

PLATE I.



Normal foot.

CASE I.—Mrs. S. G. W. (Plate III.). “The trouble in my foot began a little more than a year ago, with a cramp, which was at first relieved by removing the shoe, after which I could again put it on. This, however, lasted only a short time, and I soon found that I could not keep the shoe on at all. From then to the present time the pain has not changed any. The first symptom is a heavy, hot feeling in the foot, which frequently passes away soon, and I have no further unpleasantness; but when it does continue, it follows with a shaky, loose pain in the bone of the fourth toe, and my foot refuses to hold my weight. If I continue to walk, the pain becomes like a sore finger; it makes me sick and nauseates me. The only relief is from a hot foot-bath, as hot as I can stand it, with a piece of common washing soda or a quantity of baking soda thrown into the bath. This, with a good strong cup of tea, a hot-water bag to my foot, and plenty of rest, usually gives me relief. I have gotten rid of the trouble in an hour or two by attending to the same as soon as it began to trouble me. At other times, when I have tried to force myself to use the foot, the pain has lasted as long as two days, and again the trouble has left me at times for three weeks.”

CASE II.—Dr. G. L. R. (Plate IV.). “I first noticed the painful symptoms ten years ago; they seemed to be located about the metatarsal joint of the fourth toe; the pain was erratic in character, sometimes radiating to the calf of the leg and thigh, now and then at the extremity of the toe, giving a sensation as though the nail was being lifted with a hot iron. Cold weather gives almost entire relief. Hot weather, a close-fitting shoe, and walking aggravate it. A habit of stepping from my carriage on my left foot first greatly aggravated and, I now believe, was one of the early causes of it. The pain has varied from a mere annoyance to an agonizing, unbearable condition. At present, due to a capacious shoe and a flannel roller, I am not suffering very much. Whether or not the relief will be permanent, warm weather alone will determine.”

CASE III.—Mrs. A. R. U. (Plate V.). “When twenty-three years of age, I experienced the first symptoms of the severe malady which afterwards developed in my right foot and proved the cause of agonizing attacks from which I continued to suffer, until entirely relieved by the operation performed about seventeen years ago. The first attack occurred one day while taking a short walk, when I experienced an uncomfortable, numb sensation under the ball of my right foot, as though my stocking had formed a crease there. On my return home, I immediately removed my shoe and rubbed the affected part for a while, when all discomfort disappeared. Some months elapsed before I had another attack, but they gradually became more and more frequent, the intervals of months giving place to those of weeks and even days, until finally I could not promise myself any certain immunity. As the attacks became more frequent, the benumbed feeling was accompanied by the most excruciating pain. A seizure would occur generally in the afternoon. Then I would sit in a chair with my foot resting heavily on the floor, which seemed to afford me more strength to endure the intense agony than any elevated position. I had to be assisted to bed. At such times it was necessary to prop up the bedclothing that it might not touch my toes, which continued very sensitive for hours.

“One doctor called my malady gout. In answer to my questioning, a prominent surgeon said, ‘We will call it toeache;’ another attributed it to defective circulation. The malady continued to increase both in frequency and severity, until I had the good fortune to consult you, and in so doing, ascertained that you had already discovered the origin of, and remedy for, this most painful condition. The operation you shortly performed produced the most satisfactory results. I have never had any return of the dreaded attacks, and my right foot, as well as my left, has been, to all intents and purposes, in a perfectly normal condition.”

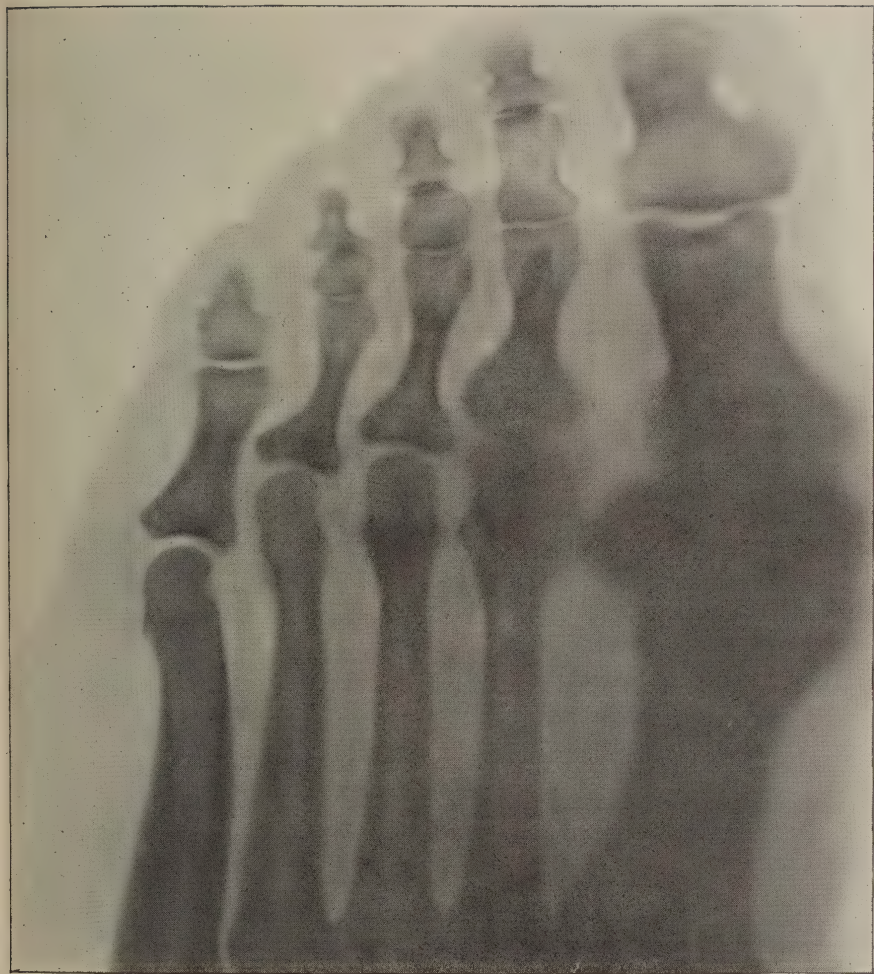


PLATE IV.—Showing same distortion as in Plate III.



PLATE V.—Showing result in a case of metatarsalgia after excision of the fourth metatarso-phalangeal joint.

LARYNGEAL VERTIGO.¹

BY FREDERICK I. KNIGHT, M.D.,

Boston.

UNDOUBTEDLY most of my hearers are familiar with cases of momentary loss of consciousness after cough, to which attention was first directed by Charcot in 1876. Since then cases have been reported and the subject more or less fully discussed by other observers. I, myself, contributed a paper on the subject to the American Laryngological Association in 1886. The name "laryngeal vertigo," which Charcot applied to these cases, and under which they have since been reported, is an unfortunate one, as in most of them there is no true vertigo. Kinshaber and McBride report their cases as "spasm of the glottis," but in most cases there is no evidence of glottic spasm. Gray calls the affection "laryngeal epilepsy," but many cases present no evidence of epilepsy.

It seems to me that the factors concerned in producing the condition are different in different cases, which makes it difficult to find a satisfactory name for it.

If we take a comprehensive view of all cases on record, we shall find that the cerebral condition can sometimes be described as syncope, which has been produced by disturbed cerebral circulation, such as we have from long-continued rapid breathing, and which was formerly employed to produce momentary unconsciousness for minor surgical operations; and sometimes it can better be described as an exhibition of "le petit mal." In some cases there is not the slightest evidence of epilepsy, and in others we find convulsive movements of the limbs, head, and face, and, in a few cases, mental confusion after the attack.

We shall also find that there is a *predisposition* to syncope or "le petit mal" in these cases, as shown from their occurrence from other than laryngeal causes. Among the fifteen collected cases which formed the basis of my paper in 1886 there was one (Kinshaber's) in which the first loss of consciousness occurred from sudden emotion, and was not preceded by cough. Subsequent attacks, though apparently caused by emotion, were preceded by cough; and Gray's patient had been subject, seventeen years before, after a scalp-wound by a bullet, to losses of consciousness like those he had later after cough; and the patient whose case I shall report to-day had one attack without cough.

We shall find, thirdly, that the exciting causes of the attacks are various. We have to do only with excitation originating at the glottis. This may be

¹ Read before the American Climatological Association at Lakewood, N. J., May 12, 1896.

due to different conditions, organic or functional. We all remember Sommerbrodt's patient, who was cured of epilepsy by the removal of a pediculated polyp of the larynx. Spasm of the glottis, or the rapid succession of closures of the vocal cords in coughing, may produce loss of consciousness by disturbance of the cerebral circulation.

I will now relate the case of a patient whom I have seen recently, and who excited in me a renewed interest in this affection. A man, fifty-four years of age, took cold at the end of September last, and had had cough since that time, till I saw him early in November. He told me that he had had a dozen attacks of loss of consciousness after fits of cough, none of the fits of cough being very severe. He also said that he had had one attack which was not preceded by cough. At times he had had twitching of the face and limbs without loss of consciousness.

On examination I found nothing marked in the larynx. There were moist râles at the base of the left lung. Pulse 80, very weak. The first sound of the heart was also very weak, suggesting degenerative disease. It seemed to me that the attacks in this case were due to syncope from a weak heart, which any disturbance like coughing might bring on, though the muscular twitching suggested nervous irritability also.

The points to which I would invite attention and discussion are these:

1. That cases of loss of consciousness after cough are not all produced in the same way.
2. That the cerebral condition may be due to syncope or le petit mal.
3. That there is a general predisposition to one or the other of these conditions.
4. That the exciting causes are various, sometimes organic and sometimes functional.

THE TREATMENT OF CERVICAL TUBERCULOUS ADENITIS.¹

BY E. FLETCHER INGALS, A.M., M.D.,

Chicago.

BEFORE the days of antiseptic surgery the treatment of enlarged lymphatic glands was left largely to the physician until suppuration occurred, and then they were allowed to rupture spontaneously or opened by a large incision, and were healed after a long period of suppuration, or were removed by the surgeon's knife; but within the last few years the comparative impunity with which operations may be made has led to a hasty resort to

¹ Read before the American Climatological Association, at Lakewood, N. J., May 12, 1896.

the knife in these as well as in many other cases, a practice which I am glad to believe is now falling into disrepute with the best surgeons. About a century ago chloride of calcium was recommended for the reduction of enlarged cervical glands, and was often given with the most gratifying results. Various other remedies were similarly employed with more or less benefit, the most important of these being iodine or some of its preparations. Under a course of treatment with one of these alteratives in a large percentage of cases the enlarged gland slowly disappeared. In less fortunate cases where the remedies were not employed soon enough, or where, for some reason, they did not produce a satisfactory result, the disease progressed for months or years, usually being attended by the suppuration of gland after gland with prolonged discharge. In many such cases the suppurating cavities finally healed, leaving the person badly scarred, but otherwise little, if any, the worse for this delayed termination, and in others, although the enlarged glands disappeared and the suppurating cavities healed, the patient remained in poor health the remainder of his days; again, with some few, though in a much smaller percentage than generally supposed, pulmonary tuberculosis develops and with its progress and usual termination the history of the case is closed.

While there seems to me no doubt that some cases of cervical adenitis should be operated upon promptly, I feel very confident that there are many others that do better under medical treatment. I am glad to find that Nicholas Senn, who enjoys the highest reputation for skill, good judgment, and conservatism, does not favor promiscuous removal of these growths, but where the glands are small and where the constitutional symptoms are not pronounced, recommends, first, a thorough trial of guaiacol internally, which treatment he tells me effects a cure in many instances.

It was formerly my practice to treat cases, in which the glands were not greatly enlarged, with iodides or chloride of calcium, but latterly I have used guaiacol or the carbonate of creosote, and injected these glands, from time to time, with a solution of carbolic acid of from two to five per cent. strength. Severe cases I have referred to a surgeon. During an experience of twenty-five years I have seen my fair proportion of good and poor results in these patients when treated by medical means, and in those cases that seemed entirely refractory to such measures. I have seen a number of cases of suppuration in enlarged cervical lymphatic glands, and have tried various methods of treating the cavity before opening it, such as the repeated injection of solutions of carbolic acid and emulsion of iodoform, but do not at present recollect of any case, excepting the one I now report, in which a successful cure of the suppurating cavity was made without resort to free opening. In the present case a few injections resulted in complete cure, and I am led to believe that similar treatment might be effectual in most cases of the kind, also that similar treatment will enable us to reduce non-suppurating glands much more rapidly than medicinal treatment alone, and will in many cases obviate the necessity of using the knife. This

does not seem too much to expect of an agent that can speedily stop the suppuration in a presumably tubercular abscess or cause steady diminution in the size of even a malignant tumor.

The case is that of H. E. V., a man thirty-three years of age, a clerk by occupation, who came to me first on the 14th of October, 1895, with the following history: Three years previously he had had a free hæmoptysis, which was followed six months later by another. Two other hemorrhages had occurred six and two months before he visited me, and finally a free hemorrhage one week before I first saw him. At that time he was troubled with cough and suffered from pain in the left lung. His appetite and strength were fair, but he had lost flesh, was having diurnal fever, and presented all the symptoms of a person with pulmonary tuberculosis. He stated that he had used alcoholic stimulants to excess until within a week, and also that he had lost a brother from consumption. A physical examination revealed dulness at the apex of the left lung as low as the first rib, with broncho-vesicular respiration and occasional subcrepitant *râles*. I prescribed a third of a grain of the extract of *nux vomica* as a stomachic tonic, half a grain of the extract of *hyoscyamus* to relieve cough, and five grains of the carbonate of *guaiacol* for its supposed specific effects upon the tubercular process in the lung; these to be taken four times daily. I at the same time ordered after each meal drachm doses of maltine with the hypophosphites, which dose was rapidly increased to half an ounce and combined with fifteen grains of the chloride of calcium. At the next visit, nine days later, as the cough continued much the same the extract of *hyoscyamus* was increased to two-thirds of a grain, and, on account of the apparent decrease in his appetite, the carbonate of *guaiacol* was reduced to three grains. He was given at the same time two grains of the muriate of berberine, the extract of *nux vomica* and other remedies being continued as before. Two weeks later it was noted that he weighed one hundred and forty pounds and was somewhat improved.

Two weeks after this his pulse was found to be 120, but he had gained a pound and a half in weight. The same general course of treatment was continued, and on the 4th of December he was doing very well, the pulse being only 106. At this time there was a swollen cervical gland on the right side of the neck as large as a hen's egg. On December 19 he reported himself as very well, pulse was only 100, and he had gained about five pounds in weight, but the swollen gland had suppurated. Owing to frequent satisfactory results which I had obtained from injections of lactic acid into tumors both benign and malignant, and to the good results which had sometimes attended its application in tuberculous ulceration, I at this time decided to inject lactic acid into the abscess cavity. With an exploring syringe I withdrew a quantity of pus amounting to about two drachms, and without removal of the needle injected a similar amount of sterilized water containing three per cent. of carbolic acid and twenty per cent. of lactic acid. This was allowed to remain a few minutes and then with-

drawn. The internal treatment was continued as before. I did not see the patient again for three weeks, but at that time the swelling of the right side of the neck was considerably smaller and much less painful, though it still contained fluid. Upon aspirating the cavity again I was gratified to find that instead of pus it contained only about half a drachm of thick greenish serum, with a few white flakes, which may have been purulent in character. At this time I injected half a drachm of a solution containing three per cent. of carbolic acid and twenty-five per cent. of lactic acid, and left it in, sealing the puncture with collodion. The home treatment was continued. Two weeks later, when the patient next reported, the swelling upon the neck was found larger than at the last visit, and he stated that he had suffered considerable pain for several days after the injection. His general health, however, remained good, and he had gained another pound in weight. At this time I withdrew about a drachm of serum containing about ten per cent. of pus. The cavity was again injected with a six-per-cent. solution of carbolic acid and thirty per cent. of lactic acid in water with a little glycerin. This solution was allowed to remain a few minutes and then withdrawn. I did not see the patient again for about a month. I then withdrew a little less than a drachm of clear serum containing no pus, and injected forty minims of a forty-per-cent. solution of lactic acid with about five per cent. of carbolic acid. This was allowed to remain a few minutes and then withdrawn. At this time, as there seemed no further need for anodynes, the capsules containing the *nux vomica* and *hyoseyamus*, etc., were discontinued, and the patient was given carbonate of creosote in doses of ten minims the first day, eleven minims the second day, and so on until the amount should reach a drachm taken three times daily, after eating. The maltine with hypophosphites was continued. He did not report again until a month later, the 26th of March, then he stated that there had been a good deal of swelling and pain in the neck after the last injection. I found that the abscess-cavity had completely healed and the remnants of the swollen gland about it had nearly disappeared. The patient was feeling very well, had no cough, and seemed in a fair way to recovery. At this time he was taking the carbonate of creosote in doses of thirty-eight drops three times daily.

I have used a solution of lactic acid several times as a parenchymatous injection into tumors, some of which I felt certain were malignant, and I have nearly always had the satisfaction of seeing the growth gradually diminish in size. It has been my custom to begin with weak solutions of not more than fifteen or twenty per cent. strength, and gradually increase to thirty-five or forty per cent. strength. I have gone beyond this several times, but forty-five or fifty per cent. will usually produce a slough. I have found that even a fifteen-per-cent. solution of the lactic acid alone generally causes considerable suffering, but when combined with from two to five per cent. of carbolic acid it causes but little pain. In some cases I have injected a four-per-cent. solution of cocaine about three minutes

before the lactic acid was employed. By so doing the immediate pain otherwise caused by the lactic acid has been prevented, and the combination of lactic with carbolic acid has prevented subsequent suffering of any considerable degree. I usually inject from twenty to thirty minims of the solution at one treatment, and do not repeat it for a week or more. One case proves nothing at all, but my experience with lactic acid in this and other cases has been so favorable that I wish to urge you to try it. I make no claims to originality in the use of this agent, but I hope that this brief sketch may interest you and be of benefit to your patients.

SOCIETY REPORTS.¹

ON SUSCEPTIBILITY AND IMMUNITY, WITH SPECIAL REFERENCE TO SURGICAL CASES.

BY DR. ROSWELL PARK,

Of Buffalo.

DR. PARK divided this subject into three classes: (*a*) local and general; (*b*) congenital or acquired; and (*c*) absolute and relative. Man seems to be immune from numerous infections which are common to many of the domestic animals,—for instance, hog cholera, symptomatic anthrax, and chicken cholera,—while he is, in common with them, susceptible to the infection of anthrax, glanders, tuberculosis, and actinomycosis. Then, too, people differ very much among themselves in susceptibility to the same disease, and, of course, we explain this, so far as mere words can, by saying that at the time of exposure their bodies were not receptive or were resistant. Susceptibility seems to be inseparable from a study of the causes which favor infection, which should be considered in the following order: (1) the virulence of the infecting organisms and the amount introduced; (2) association; (3) hereditary influences; (4) local predisposition; (5) vestiges and disappearing organs and tissues; (6) pre-existing disease; (7) personal habits and environment; and (8) foetal infection.

Immunity may also be (*a*) local or constitutional, and (*b*) congenital or acquired, and acquired immunity may be natural or artificial. Immunity is, in some sense, a racial characteristic, as, for example, in the case of the Japanese, who, it is said, never have scarlet fever, but are more susceptible to beriberi than are Europeans, while the negroes escape yellow fever and

¹ Papers read before the American Surgical Association, Detroit, Michigan.

are less liable to malaria and dysentery than are Europeans. Acquired immunity is not necessarily a matter of juggling with bacteria of the disease in question, but may be produced by the employment of others.

In a general way it may be said that the conditions which afford protection, so far as they are controllable by the surgeon, are those which tend to increase what, for lack of better knowledge, we must call vital resistance, and to decrease vulnerability. In closing the author said,—

“The conclusions of surgical importance, which may be legitimately reached from the study of the conditions dealt with in this paper, are essentially these: that the surgeon in emergency cases has to do the best he can, not merely with the means at hand, but with the tissues at hand; and here, so long as he can control what may happen outside of the body, he has done his full moral and legal duty. On the other hand, in any case where patients deliberately come under observation, and where time may be afforded, it is the surgeon's bounden duty, bearing in mind a summary of the conditions which notoriously conspire, upon the one hand, to lower vulnerability, upon the other hand to afford protection, to so order the habits, the diet, the surroundings, and the preparation of his patient as to restore his tissues and vital fluids, so far as possible, to their normal condition before he interferes with their functions by an operation.

“A distinct and as yet an unworked field lies before him who will study carefully and for sufficient length of time the effect of anæsthetics in increasing susceptibility and infection. This is a problem which must be worked out rather upon human patients than upon animals, since the conditions are so exceedingly different, most of the animals used for experiment being too relatively susceptible,—dogs notoriously so. I have for years cherished the opinion that anæsthetics affect all people to a greater or less degree in this direction, yet am not able to present to you any definite statistics or statements. Loss of blood is certainly a factor lowering vitality; and in that complex condition of shock it must assuredly be that natural immunity is at least temporarily lowered. Equally important in my estimation are the auto-intoxications and toxæmias, of which two particularly call for mention here. The effect of sugar in the urine, or rather the effect of the condition which leads to its presence, is everywhere recognized; but I am more and more convinced that in the body condition which is most easily recognized by hyperacidity of urine, and which is so often a complication of uricacidæmia, oxaluria, etc., we have a grave and sometimes insuperable obstacle to ideal success after operating. The other condition to which I particularly allude is that which I usually speak of as intestinal toxæmia, and relates to auto-intoxication produced by absorption from the contents of the alimentary canal of substances which ought not to be therein retained, nor allowed to so accumulate nor undergo chemical changes which shall permit such absorption. This condition is in a large measure represented by chronic constipation; and yet it certainly does occur in patients who have a regular daily habit of alvine

evacuation. It is to be recognized by the hue of the skin, by the appearance of the tongue, often by the presence of indol or indican and ethereal sulphates in the urine, and quite often by the diminished elimination of the fluid and mineral elements of the urine. It should be combated, if possible, by a careful course of hot-air or Turkish baths, copious draughts of fluid, the administration of saline laxatives, and of intestinal antiseptics, among which, in my estimation, the very best is a solution of mercury and arsenic in hydrochloric acid (given in the shape of mercuric chloride, dissolved in dilute muriatic or nitro-muriatic acid, with the addition of liquor arsenosi chloridi). I have tried a great variety of the vaunted intestinal antiseptics, but have settled upon the conviction that some such mixture as this gives results far superior to any which can be obtained from salol, naphthaline, etc. If, in conjunction with these measures, we resort to exercise, when it can be taken, to sunlight, which is always available, and perhaps to massage, by which circulation is quickened and equalized, excretion hastened, and waste material dislodged and taken out of the system, we have done what we can to prevent infection.

“And I have, furthermore, for years contended that since the inauguration of the so-called antiseptic era, and in our enthusiasm for combating infection from without, we have lost sight of a most important truth, which we cannot afford to disregard,—viz., that in our enthusiasm for combating infection from without we have almost neglected the measures for, first, the recognition, and, second, the successful prevention of infection from within. Certain it is that, in the majority of instances, the latter (*i.e.*, infection from within) is much the more liable to ensue, and particularly in a class of cases where one is tempted, for one reason or another, to be less careful than he ought to be. I would give, then, this most important practical conclusion to my remarks, that only he who weighs judiciously the possibility or the imminent probability of one or the other of these forms of infection is really capable of guarding against both of them, and that the best surgeon is he who will always take time, when it can be afforded, for the preparation of his patient for operation. In other words, I would remind you of Sir James Paget’s too often neglected statement, that we ought to examine patients for operation with fully as much care as we do for life insurance; and add to it that if this examination be so conducted, we shall often find that which will make us hesitate, and prepare them before subjecting them to the enhanced risk of what may in other respects seem for their good.”

REMARKS ON PERFORATION OF THE NASAL SEPTUM.

DR. CARL SEILER, of Philadelphia, read a paper on this subject at a meeting of the State Medical Society, at Harrisburg, Pennsylvania.

The writer believes that perforation of the nasal septum, and especially of its lower cartilaginous part, is by no means as rare an occurrence as is generally believed. On the contrary, such cases are quite numerous, and the perforations, although unsuspected and easily overlooked at a cursory examination, are frequently the real cause of a long train of symptoms known in a general way as nasal catarrh. Such lesions are looked upon as pathognomonic of syphilis. While this may be true when the perforation exists at the upper bony part of the septum, syphilis is but rarely the cause when the lower or cartilaginous plate alone is affected.

Local causes may produce this condition, and among them may be mentioned continued traumatism. Any frequently repeated and long continued traumatism, though slight at each occurrence, may result in irreparable damage.

Take for example a case in which a depression exists on one side of the cartilaginous septum, produced by continued pressure of a hypertrophied lower turbinated bone or by a localized projection of the nasal septum itself. Such a depression would be a favorable site for the accumulation and inspissation of mucus. A scab soon forms as a result of this drying, causing irritation to the patient, so that he endeavors to remove it either with the finger-nail or by forcible blowing. Slight bleeding follows expulsion of the scab. Such a traumatism may readily loosen the epithelium in the depression and remove the natural covering of the parts and result in abrasion. The frequent repetition at short intervals of even such a trifling loss of tissue must in the aggregate exceed the natural repair, and thus gradually deepen the depression in the septum, which finally results in perforation. This opening, at first extremely small, gradually increases in extent until it may reach a considerable size. Another cause of perforation of the cartilaginous septum is an excoriation or partial necrosis of the nasal mucous membrane so frequently observed in typhoid as well as nasal diphtheria. Rarely abscesses between the cartilaginous plates of the septum cause this condition. The presence of foreign bodies is a more frequent cause, and, finally, unskilful or mistaken surgical interference for the removal of nasal obstructions may result in the formation of a perforation.

The treatment of this condition must be based upon the peculiar pathological, anatomical, and physical conditions in the first place, and upon the extent of the lesion in the second.

Scrupulous cleanliness, topical applications, and surgical interference when necessary constitute the lines of treatment.

In certain cases the closing of the communication between the two fossæ may be secured by means of a hard rubber obturator held in place by a set-screw or clamp somewhat after the fashion of the modern patent sleeve-button. The objection to the obturator, however, is that it does not favor the healing of the denuded cartilages, but simply covers up the opening and consequently does not prevent further necrosis. In this way the lesion continues to increase in size, and it is necessary to increase the size of the obturator plate from time to time in proportion. The most radical method of treatment of these perforations, otherwise incurable, is to perform a plastic operation by cutting out a piece of one of the plates of the cartilaginous septum either above or below the site of perforation large enough to cover it. The piece so removed, after denuding the edges of the perforation by means of a galvanic cautery knife, is held in place by plugs of wood or ivory covered with aseptic punk, or by means of delicate silk sutures introduced through the whole of the thickness of the cartilaginous septum. This latter method of operation the author has employed successfully in a number of cases, and the results have been most satisfactory.

TUBERCULOUS PERITONITIS.

BY ROBERT ABBE, M.D.,

New York.

IN reviewing this interesting subject Dr. Abbe thought it gave a fairer understanding of the multiform appearances of the disease if we viewed it from the stand-point of the bacillus rather than, as others have, from the gross appearance which has led to the division into the ascitic, the dry, and the caseating form.

A sudden tuberculous eruption into the peritoneal cavity may be as acute in symptoms and duration as acute peritonitis from other causes. A slower outbreak may result in ascitic distention in three or four weeks, and a less virulent bacillus action may occupy months in inducing ascites and wasting.

In other cases, possibly due to the route of invasion (penetration through lymphatics, communicating mucous and peritoneal serous coats, or by follicular ulcers,—allowing tuberculous milk to be the medium of infection) a dry or adhesive form follows, in which hectic and rapid wasting result.

Again, the bacillus produces an outpouring of thick lymph and flocculent serum which rapidly becomes purulent, producing unsymmetrical cakes of thickened omentum, matted coils, and encapsulated purulent collections.

The bacillus products rapidly caseate, and ulcerating fistulæ may result.

All phases of the disease may be regarded as representing the life-history of the bacillus and its products.

Tuberculous peritonitis may be and, in the early stages, often is the only site of tubercle deposit in the patient. Hence, if overcome here, a practical cure often follows.

Even when other phases of infection (pleural, intestinal, bronchial) are seen, an operative cure of the peritonitis has often been followed by general recovery.

The mode of entrance of the bacillus is directly through the intestinal wall, or through ulcerating appendicitis or tubal or ovarian tuberculosis, or through the blood.

The claims of a few recent authors, to having cured tuberculous peritonitis by medical treatment, were reviewed and credited.

The unquestioned cure of true tuberculous peritonitis by laparotomy was proved by two classes of cases, those who have long survived operation and those who, having come to autopsy long afterwards, have been found free from tubercles that studded the peritoneum at operation.

Experimental proof in animals corroborates, also: operation by simple laparotomy and evacuation of the ascites—closing the dry abdomen—is credited with a large number of cures.

Irrigation with warm salt solution is advocated by preference. Camphor-naphтол application, as used by Rendu, is advised for bad cases.

Dr. Abbe reviewed many interesting and illustrative cases in speaking of direct medication.

The many theories advanced to account for the surprising cures were carefully considered, and it was said, in conclusion, that the theory that is sustained by most facts is that based on the life-history of the bacillus and the capacity of the animal economy not only to suppress the activity of the organism by encapsulating it, but to remove it by absorption.

The proper opportunity for conquest is not afforded in the presence of ascitic fluid, which acts as a veritable culture bouillon, and by its fluidity aids dissemination.

When, however, the peritoneum has been aroused by congestion which follows evacuation, and a reactionary inflammation is set up, engendering cell hyperplasia, the intruder is walled in and retrograde degeneration sets in.

*TUBERCULOSIS OF THE FEMALE GENITAL ORGANS
(INCLUDING TUBERCULOSIS OF THE KIDNEYS).¹*

BY ALBERT VANDER VEER, M.D.

IN his paper some stress was laid upon the benefit accruing from the past study of abdominal surgery, also reference made to the pathology of older writers, and recent advances in this direction, one of the most important considerations being in the study of the pathological conditions presenting, from the stand-point of histological and bacteriological examinations for the tubercle bacilli. The subject of tuberculosis of the external organs of generation was carefully considered, also of the vagina and cervix, which, though exceedingly rare, still has a clinical history, and, while it is possible to find it as a primary development, from contact with the bacilli of the external surfaces, etc., careful investigation has proved that the ulceration is found, in the majority of cases, on the posterior wall of the vagina. This is the result of, possibly, the deposits of tubercular discharge from the tubes, from the uterus, possibly from bacteria being deposited there in the diseased condition of the male, or from such conditions as previous local lodgement, and the disease developed in that way.

Laceration of the cervix was also emphasized as being a point for development of tuberculosis. Stress was laid upon the fact that the disease was manifestly local, from a tubercular condition of the entire system. Some of the saddest cases in our practice are the ones associated with advanced phthisis.

Careful consideration was given to the subject of tuberculosis of the uterus in the form of tubercular endometritis, and to the fact that the uterus occupies a position for attack from the disease from without as well as from secretions from the tubes. By far the largest number of cases are found in disease of the tubes, fully eight or ten per cent. of the cases of diseased tubes being of the character of tubercular trouble, and unquestionably the focus for the development of tubercular peritonitis. It is noted that the greater number of cases of tubercular disease of the tubes is found among young unmarried women, and not in women who had been married a number of years and borne children. Heredity presents as a strong element in these cases. Garrigues says that "the wall is swollen, its epithelium is thrown off, the ostia are generally closed, the calibre enlarged, and tube filled with a caseous mass."

Tuberculosis of the ovaries is exceedingly rare, yet is to be observed in the form of the caseous variety.

Tuberculosis of the female genital organs is of two varieties: miliary

¹ Read before the American Surgical Association, Detroit, Michigan.

tuberculosis, and chronic, diffuse, fibroid tuberculosis, the latter being known and described in the past as the caseous form of the disease.

In the diagnosis of tuberculosis of the female generative organs, much attention should be paid to the conditions of that individual case, by differential diagnosis, or by exclusion. Whenever it is possible to secure some of the discharge, either from the tubes or from the uterus, more particularly, it should be examined for bacilli. The gross appearance of the sore, in connection with the external genitals, is that of the hardened split pea, more particularly, also within the vagina, with more or less moisture; and the greater the amount of discharge the more rapid seems the tendency to necrosis and breaking down of tissues, with increase of odor. Here the error has frequently been made, especially in regard to the cervix, in mistaking it for malignant disease in the form of carcinoma. The possibility of specific trouble must not be lost sight of. This error is to be avoided by careful microscopical examination of the secretions. There is no doubt that many of the so-called gonorrhœal cases of pyosalpinx are the result of the grafting of the specific form of the disease upon the tubercular tubes already existing, and that it is in these cases we find, when cutting the tubes across, a solid mass of caseous infiltration.

Too much stress cannot be laid upon the necessity of an early diagnosis; and when the disease is locally confined to the external genitals, to the vagina, or to the cervix, or occurs in the form of tubercular endometritis, most gratifying results follow prompt energetic local treatment, such as curetting of external ulcers, of the cervix, or of the cavity of the uterus, the application of carbolic acid or iodine or the use of peroxide of hydrogen; when the discharge is very free and contains pus, packing of the vagina and of the uterus thoroughly with strips of iodoform gauze is to be recommended, and is followed in many cases by prompt recovery.

Repair of a lacerated cervix is not to be forgotten, but is to be done thoroughly.

When it is positively decided that the tubes and ovaries are the source of the disease, a prompt operation for their removal is emphatically demanded. It cannot be done too early, and removal of the appendages on each side is recommended.

The writer's own preference is for abdominal section, believing that his results therefrom have been better than when working through the vagina.

Tuberculosis of the kidney still remains in an exceedingly obscure state. It presents in the form of miliary or general tuberculosis, and the caseous, scrofulous, or true disease of the kidney.

Reference was made to the lectures of the late Alonzo Clark, and his careful classification and diagnosis of the true scrofulous kidney. The symptoms are not altogether clear. The patient complains of pain about the lumbar region; there is a group or lot of symptoms in addition to the lumbar pain, a sense of weight, of dragging about the side affected, extending downward into the inguinal region, accompanied, perhaps, with some

nausea, with loss of appetite, emaciation, and a languid, restless feeling. The patient does not suffer the acute pain of renal colic, etc., that accompanies most of the other lesions of the kidney, but she is not well. Miliary tuberculosis is usually accompanied with development of this disease in other parts of the body. Miliary tuberculosis is the disease of childhood and adolescence, in children occurring more frequently up to the age of ten years. As to the manner in which the common, cheesy, surgical, scrofulous, tubercular lesions of the kidney present, it is believed by those who have studied the subject thoroughly that it is, as a rule, a primary tubercular focus in the lower urinary or genital structures, which gradually extends upward along the mucous surfaces to the bladder and ureter to the kidney.

Chronic renal tuberculosis is noticed in middle life and on in advanced life. It is possible for it to be confined entirely to one kidney, and perhaps destruction of that gland, resulting in a cirrhotic mass or cheesy substance, the kidney becoming incapsulated.

Temperature is the important consideration in the study of tuberculosis of the kidneys, there being a most decided rise at night, continuing thus for several days, which we are not able to account for in the search for tubercular lesions about the system elsewhere.

In all these cases the urine should be carefully examined as to the possibility of bacilli being present, but Dr. Kelly, in a recent article in the *Johns Hopkins Hospital Bulletin*, vol. vii., February and March, 1896, states that this is a very difficult point to settle: often bacilli are not to be found, yet on operation a tubercular condition of the kidney is present.

Dr. Vander Veer reported several cases from his own practice, and emphasized immediate or prompt removal of the kidney and ureter when once the diagnosis was clear, or that an exploration should be made. His own preference is for nephrectomy in all cases possible, doing an extraperitoneal operation, giving most decided endorsement to the nephro-ureterectomy of Kelly.

In all these cases the patient should be given the benefit of a general tonic course of treatment, such as tends to relieve general tuberculosis of the system.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

The Pathognomonic Symptoms of Congenital Syphilis. (*Berliner klinische Wochenschrift*, February 17 and 24, 1896.) By P. Silex, M.D., of Berlin.

Keratitis interstitialis is the commonest syphilitic disease of the eye in young children, but its presence is only presumptive evidence that syphilis exists. A characteristic lesion, however, is a peculiar form of areolar chorioiditis. Scattered over the fundus, particularly in the macular region, are black points and spots, with here and there white spots of larger size, and finally larger white areas with black borders.

Various forms of Hutchinson's teeth have been described, but the only ones that are absolutely pathognomonic are those that present erosions of the two inner upper incisors. Scars are frequently found about the lips and at the corners of the mouth in hereditary syphilis, but as they may also occur as the result of wounds, boils, lupus, canceroid and particularly scrofulous eczema, they are in no sense characteristic. A peculiar form of scar-formation, however, occurs, in which radiating white lines arise from the lips and then give branches that may involve a considerable portion of the face. These scars are from one to three millimetres broad and about one millimetre deep, and their situation bears a certain relation to the subcutaneous muscles. Histologically, they are not properly scars, for the microscopical examination of excised fragments reveals the presence of the papillæ, and that the epithelium is broader than normal, rather than contracted; moreover, the glands and vessels are easily recognized. A small-cell infiltration is found in the corium, and the intima of some of the vessels is thickened. Silex believes that these lines represent the wrinkles of the skin produced by muscular action that have not become smooth, and proposes to call them pseudo-scars. This wreath of pseudo-scars with branches extending into the face occurs only in congenital lues. The three absolutely pathognomonic signs of hereditary syphilis, then, are: 1,

the peculiar chorioiditis areolaris; 2, the erosion of the crowns of the upper inner incisor teeth; 3, the pseudo-cicatrices of the lips and face.

A Case of Paralytic Lyssa Humana. (*Wiener klinische Wochenschrift*, April 16, 1896.) By E. Bamberger, M.D., of Vienna.

The patient was a peasant boy, nineteen years of age, who was brought to the hospital on the third day of the disease. The symptoms on admission were marked hydrophobia when liquids were offered and respiratory spasm upon peripheral irritation. At first the sensorium was free, but later there was some delirium, and, towards the last, violent convulsions and cramp asphyxia. On the day of death the temperature rose to 40° C., and there was a post-mortem rise to 41.5° C. The autopsy revealed the ordinary hyperæmia of the meninges, and, as a curious accidental discovery, a large cyst in the superior vermiform process of the cerebellum. Three rabbits inoculated with the substance of the brain, the cord, and the ventricular fluid, sickened upon the seventeenth day, and died with the characteristic symptoms of rabies. Two interesting features of this case were, first, the total absence of any history of injury, and, second, the appearance of a paralysis on the fourth day of the disease. This involved the left upper extremity, motion being completely lost at the elbow and shoulder-joints, although the fingers still retained some power of movement. At the same time, some incoördination appeared in the movements of the right arm, and later the trunk was also paralyzed. The legs, however, moved strongly until the last. Slight hyperæsthesia was also noted in the left arm. The case presented the type of cervical paraplegia, and in the absence of any neuropathic hereditary influence, Bamberger prefers the explanation of Schaffer, that there is a myelitis of the segment that corresponds to the region of the bite. The case was treated with the serum of an immune sheep, ninety-five cubic centimetres being given in two injections, but no effect was produced.

A second case that was observed later is also added to this report. It presented the following unusual features: A negative history; the presence of a motor paresis affecting the extremities of the right side, and to a lesser extent those of the left; the occurrence of numerous toxic cramps, particularly in the paretic limbs, that were similar to the cramps of tetany. Chvostek's symptom, however, was absent. Aside from slight œdema and congestion of the cortex, nothing abnormal was found in the brain. Rabbits that had been inoculated with the substance of the medulla died of typical hydrophobia.

Bacteriology of Rheumatoid Arthritis. (*Medical News*, May 23, 1896.) By Joseph Collins, M.D., of New York.

The obscurity in which rheumatoid arthritis has been veiled bids fair to become dissipated by recent investigations into its bacterial origin. Three years ago Schüller (*Berliner klinische Wochenschrift*, September 4, 1895)

described a micro-organism which he had found associated with rheumatoid arthritis. It was about 2.6μ long, 0.75 to 0.995μ broad, and exhibited marked polar stains. It was easily receptive of the ordinary stains, and grew with readiness on ordinary culture media, such as gelatin and agar-agar. Recently, Drs. Bannatyne, Wohlmann, and Blaxall have made a contribution to the clinical history, etiology, and pathology of rheumatoid arthritis (*Lancet*, April 25, 1896), which is in the line of Schüller's observation, and which, if substantiated, will be epoch-making in the history of the disease. Drs. Bannatyne and Wohlmann were led, from observation of the clinical aspect of cases and from a knowledge of the work that had already been done in the endeavor to elucidate the cause of this disease, to the conclusion that the disease was due to a micro-organism, and, moreover, they had found, by microscopic examination of the synovial fluid from the affected joints, the presence of a constant and distinct organism. Dr. Blaxall was asked to corroborate or deny these findings. After a most extensive and painstaking examination, the latter found that in the synovial fluid of eighteen cases of rheumatoid arthritis there was an organism which was constant in its characteristics. This organism, morphologically, is a minute bacillus, exhibiting marked polar changes and of variable length,—up to 3μ , or possibly 4μ . It can be grown in culture media; in beef broth it gives the appearance of gold dust, and on agar-agar and serum its growth is almost invisible. It does not grow on gelatine at ordinary temperature. On account of the small size of the organism, and of its slowness of growth, it was found necessary to conduct the experiments on a large scale—two hundred and fifty cubic centimetres of the culture medium—so that any changes in the medium might be easily detected.

In severe cases the organism is found in the blood, but as yet it has not been found in the synovial fluid from distended joints due to other causes. Whether or not the bacteria are present in the synovial membrane cannot yet be said, as experiments to affirm or deny this have not been carried out.

Although Dr. Blaxall is very positive that the organism discovered by Drs. Bannatyne and Wohlmann is not identical with that described by Schüller, we cannot see that he substantiates his position by any incontestable proof. They are practically of the same dimensions, they exhibit marked polar staining and are easy of decolorization. But whether they are or are not identical, the discovery remains an important contribution to the subject.

Lawrie's Views of the Malarial Parasite.—In an editorial in the *British Medical Journal* for May 16, 1896, the writer further reiterates a previously expressed opinion that the view of Surgeon-Lieutenant-Colonel E. Lawrie, of Hyderabad, regarding the conception that Laveran's bodies are not in the nature of parasites, is entirely wrong. Dr. Lawrie is credited with a statement to this effect, upon the truth of which he still insists; and,

considering the present position of sanitary affairs in India and the possibility that public opinion may be influenced by either of the opposing views on this subject, the editorial in question deemed it advisable to repudiate once more Dr. Lawrie's views. It seems that Dr. Lawrie has stoutly asserted that Laveran's bodies are not parasites, and that the figures and descriptions of those bodies given by distinguished writers are misleading; and that the bodies in question are neither more nor less than white blood-corpuscles in various stages of development, variously altered by the true cause of malarial disease, which he considers is still unknown. The editorial referred to considers that Dr. Lawrie's views are founded on an absolutely novel doctrine regarding the origin of white blood-corpuscles,—viz., that at its earliest stage the red corpuscle is nucleated, the white corpuscle being derived from the nucleus of the young red corpuscle,—in fact, that it is the nucleus of the latter which has escaped and become free in the blood plasma. According to Dr. Lawrie, the evolution of the white corpuscle takes place principally in the spleen. When this organ becomes diseased by malarious influences, the escape of the nucleus of the red corpuscle does not take place, evolution is arrested, and the still nucleated red blood-cell passes into the general circulation. It is this nucleus which Lawrie holds to be Laveran's body, which is, he says, an immature white corpuscle. Thus the whole of Lawrie's theory in this matter hangs on a question of physiology,—the origin of the white blood-corpuscle. Views on this point have hitherto, it is true, been somewhat indefinite, but no one has ventured to assert that the white corpuscle originated from the red corpuscle, though a possibility of the reverse has in some instances been suggested. The slender evidence advanced by Lawrie on a theory so diametrically opposed to the accepted views of leading physiologists would cause one to hesitate in accepting it. If Lawrie's views as to this origin of the white blood-corpuscles are wrong, it necessarily follows that that which hangs on these views—his theory of the nature of Laveran's bodies—is also wrong. The writer believes that the descriptions and drawings of Laveran, Marchiafava, Golgi, Mannaberg, and many others are substantially correct, and that Laveran's bodies are genuine parasites; moreover, that they are the cause of malaria,—not, as Lawrie would have us believe, one of its effects. The suggestion is made that the bodies found by Lawrie in the spleens of frogs may be the sporulating forms of *drepanidium*, or of *dactylosoma*, or of some other and similar intracorpuseular parasite, and that he may have been misled in this way.

On the Life-History of the Malarial Germ Outside the Human Body. (*British Medical Journal*, March 14, 21, 28, 1896.) By Patrick Manson, M.D.

The plasmodium enters the human body for one of three reasons: First, a residence there is in some way necessary for its evolution and existence as a species; second, it may enter accidentally and find a suitable medium in

which to maintain itself, but not to propagate its species; third, it may find not only an asylum, but also a suitable place in which to propagate its species, although it possesses other hosts or media elsewhere in nature,—that is to say, man may be an alternative host and the malarial infection of man an example of optional parasitism. As malaria abounds in the tropical wildernesses, the first cannot be true, nor can the entrance be purely accidental, since exposure is almost certain to result in infection; it must, therefore, be a case of optional parasitism. The earliest extracorporeal form is the flagellate body. This appears upon the slide about fifteen to twenty minutes after the blood is drawn. It contains particles of melanin in active motion, and at times a flagellum breaks away and swims about in the plasma with a spirillum-like movement. The flagellate body arises in this wise: at certain times in ordinary tertians, large pigmented intracorporeal forms are seen, and some large spherical bodies not enclosed in red blood-cells; occasionally an enclosed form may be seen to escape and become a free body. After a time the pigment in the free body becomes violently agitated, the body itself is contorted and jerked about, and then suddenly long flagella are projected from its circumference and begin waving about. In certain chronic malignant forms, crescents are also found,—that is, crescent-shaped intracorporeal bodies with a mass of pigment in the centre. After the blood is drawn these gradually assume a spherical form, the pigment commences to be agitated, and finally the flagellate body is formed as from the spherules. Now this transformation must be either a degenerative change or a vital evolutionary one. That it is the latter is indicated by its definitiveness of form, by its movement, and by its adaptation to a certain definite purpose in the life-history of the organism. The movement of the pigment is not of the nature of the Brownian movement. Under favorable conditions, one of which is a temperature below that of the human body, nearly all the crescents and spherules develop into this form, and it can be found in nearly every case if carefully sought. The flagellum probably represents the spore of the rosette form, and the crescent bodies and the spherules of the tertians and the quartans are the extracorporeal homologues of the intracorporeal sporulating bodies. It is not impossible that the flagellate bodies arise from conjugation forms, the result of multiple infection of a blood-corpuscle. The exit of the plasmodium from the human body must take place either by its own active efforts, or as the result of hemorrhage, or as the result of some outside influence, such as a suctorial parasite, and the close analogy between the plasmodium and the filaria, as well as the association of malaria and mosquitoes in various regions, renders the last explanation not unlikely. In the human blood, the corpuscle acts as a protection to the organism, for when the spores burst out, the phagocytes actively attack and envelop them; and the same is true of the extracorporeal flagellate forms upon the slide. At the suggestion of Dr. Manson, Surgeon-Major Ross, of India, undertook to make a careful study of the relation of the mosquito to the malarial parasite, selecting those cases in

which the crescents were common. It is obvious that one of only three results must occur in the body of the insect; first, the plasmodium would be killed; second, it would behave exactly as upon the glass slide; third, there would be a rapid development into the flagellate form. From the examination of blood from mosquitoes that had been fed upon a patient suffering from malarial cachexia, Ross concluded that, 1, almost all the crescents are converted into spheres shortly after they enter the mosquito's body; 2, the spheres are always found, at first with the pigment massed in the centre, next with the pigment particles in a state of violent agitation, whilst the whole cell acquires a jerking movement; 3, the flagellate organism may be found from seven to thirty-five minutes after the blood is drawn, the whole manifestation ceasing in a very few minutes; 4, spent spheres or pigment masses—that is, the discarded bodies of the flagellate forms—are seen at first in small numbers, later they increase; 5, phagocytes containing spheres and pigment begin to be seen later than the free spent pigment; 6, about thirty per cent. or forty per cent. of the spheres fail to throw out flagella. Quinine appeared to have a paralyzing effect upon the plasmodium and its evolution was delayed. Water in which some of the fed mosquitoes had died was given to a healthy native, and eleven days later he had headache and a rise of temperature, and plasmodia were found in his blood; in other instances this experiment did not succeed. There remains yet the careful tracing of the flagella to their resting place in the cells of the mosquito and then a study of their further existence. Certain objections must be considered: 1, mosquitoes exist where there is no malaria, but it is easy to imagine that other conditions are necessary to the existence of the parasite; 2, malaria is said to exist where there are no mosquitoes, but this Manson, after careful inquiry, doubts; 3, certain students believe that the flagellate form is a degenerate stage. Manson considers that the most serious objection is the fact that the cycle has not yet been completely made out.

Local Increase of Eosinophile Cells in Carcinoma, with Remarks upon the Significance of the Eosinophile Cells in General. (*Centralblatt für Allgemeine Pathologie und pathologische Anatomie*, March 15, 1896.) By E. Przewoski, M.D., of Warsaw.

Local collections of eosinophile cells have already been found in certain inflammatory processes, particularly in the skin in cases of lymphoderma perniciosum, eczema, and pemphigus, in the sputa of asthmatic patients, in hemorrhagic pleural exudates, and in gonorrhœal pus, especially in proctitis. The author has found eosinophile cells, and, indeed, in considerable number, in four cases of carcinoma of the cervix uteri, always mingled with other leucocytes in the area of round-cell infiltration. This discovery impelled him to make a study of the cells with oxyphilic granula; using as material the blood, lymph glands, spleen, and bone marrow of men, horses, dogs, rabbits, and pigeons. He finds that the cells differ in size, in the number and staining properties of the nuclei, in the size and

distribution of the granules, and in the amount of protoplasm. Nuclei were not found, but centrosomes were present, particularly in the cells from the bone marrow of young rabbits. The archoplasma is a thread-like structure, the fibres radiating from the centrosomes, either directly or with a narrow clear space surrounding the latter. The cellular protoplasm seems to be excessively fragile. That the granula are not composed of fat is proved by the facts that they are not soluble in ether, alcohol, xylol, etc.; that they stain readily with the acid aniline colors; that osmium acid does not blacken them; that they occasionally appear to have a crystalline form, and that they contain some water; nor are they, as is proved by the absence of a reaction with iodine, carbohydrates. Ehrlich has urged that they cannot be albuminoids, because they are soluble in an eight-per-cent. solution of carbolic acid in glycerin and retain their staining powers after exposure to high temperatures. They are soluble in acids and alkalies and platinic chloride; water causes them to swell. A mixture of a half-saturated solution of potassium ferrocyanide and hydrochloric acid stains them blue, and ammonium sulphide and hydrochloric acid stain them dark green. These latter reactions, together with their staining properties, led Przewoski to believe that they contain a certain proportion of iron and are albuminous in nature. With Ehrlich and Löwit, he thinks that they originate from the altered protoplasm of the leucocytes; but he does not consider that they have any relation whatever to the neutrophilic granula of other cells. From the fact that the eosinophile cells are found in normal persons in the blood-forming organs, particularly the bone marrow of adults, the author concludes that the eosinophile cells act in a manner the part of glands, and secrete the granular substance that subsequently enters into the plasma and there forms the raw material from which the hæmoglobin is developed. In the embryo, on the other hand, eosinophile cells are not in excess in the blood-forming organs, and other cells probably participate in this function at this time. In the blood of certain invertebrate animals, in which there are no erythrocytes, cells occur that contain granula not unlike those of the eosinophile cells; and in the human blood the eosinophile cells certainly lose their granules to the plasma. Karyokinetic figures are exceedingly rare, but do occur. The presence of eosinophile cells in the tissues of certain chronic inflammatory conditions is at present inexplicable.

New Method of estimating Quantitatively the Amount of Fibrin in the Blood. (*Centralblatt für innere Medicin*, January 4, 1896.) By A. Kossler M.D., and T. H. Pfeiffer, M.D., of Graz.

In order to determine quantitatively the amount of fibrin in the blood it is only necessary to know the amount of the fibrin-forming elements, and the changes occurring during coagulation may be neglected. Fibrin is the calcium compound of thrombosin, which latter is itself a compound formed from the nuclein bodies and the fibrinogen of the plasma, and not coagulable. The real excitant of coagulation is leukonuclein, a body that exists

in the nuclei of the leucocytes, in combination with an albuminoid body in the form of nucleohiston. In blood obtained by venesection a decomposition takes place in the white blood-cells,—that is, they yield nuclein to the plasma, where it separates the fibrinogen into thrombosin and another albuminous body. The calcium salts then unite with the former to produce fibrin. The value of the quantitative estimation of fibrin will probably become apparent when the subject of immunity is more fully understood, as the fibrin generators, according to the investigation of Tichomoroff and Freund, take part very likely in the production of passive immunity. The method now in use is elaborate and involves many sources of error. Now, in the formation of fibrin there is a separation of a part of the albumen contained in the plasma; therefore, the serum must contain less,—that is, be poorer in nitrogen. The method proposed consists of the determination of the amount of N in the plasma and in the serum, which can be done with great certainty, and then the calculation from these results of the amount of N in the fibrin. The procedure is as follows. The blood from a vein is received in a graduate that contains a sufficient quantity of a solution of potassium oxalate (about five cubic centimetres of a four-per-cent. solution to ninety-five cubic centimetres of blood) to prevent coagulation. The plasma is then separated from the corpuscles by centrifugation, and the amount of N contained in it determined by the method of Kjeldahl. Then to a definite quantity of the oxalate plasma sufficient solution of calcium chloride (five cubic centimetres of a two-per-cent. solution to twenty cubic centimetres of 0.2 per cent. oxalate plasma) is added to produce coagulation. The serum is now separated and the amount of nitrogen

determined. This result is multiplied by $\frac{p+k}{p}$, p equalling the amount of N in the artificial serum and k the quantity of the solution of calcium chloride; and the result equals the amount of N in the normal serum. The final calculation is made according to the following formula.

$$Nf = \frac{v}{v-v_1} (Np - Ns \frac{p+t}{p}).$$
 In this Nf equals the amount of nitrogen in the fibrin of the normal plasma; Np , the N of the oxalate plasma; Ns , the N of the oxalate serum; v , the volume of the oxalate plasma; v_1 , the amount of oxalate solution in one hundred centimetres of blood; p and k as before. The range of error of this method depends, 1, upon the accuracy of the work; 2, on the greatness of the difference between the two nitrogen values. In careful work the range should not exceed ± 0.4 per cent.; or, the amount of fibrin N in one hundred cubic centimetres of blood might be \pm eight milligrammes from the true value. The limits of fibrin N so far determined in one hundred cubic centimetres plasma are 0.05 gramme and 0.15 gramme, and the extreme range of error therefore is sixteen per cent. The presence of leucocytes in the plasma after the subsidence of the red blood-cells is liable to give too high a value to the

amount of N in the plasma, and they must be precipitated by the centrifuge. Three cases were examined by this method, and the amount of nitrogen represented in the fibrin was determined, as follows: a case of typhoid fever 0.0678 gramme N ; a case of facial erysipelas 0.1043 gramme N ; a normal man 0.0460 gramme N .

Practical Aids in the Diagnosis of Pericardial Effusions in Connection with the Question as to Surgical Treatment. (*British Medical Journal*, March 21, 1896.) By William Ewart, M.D.

The author enumerates the following characteristic signs of pericardial effusion: 1. Considerable extension of the lateral boundaries of the total area of dulness. 2. Great extension of the absolute dulness, the sternum absolutely dull. The latter is due to separation of the lungs, and is not pathognomonic, as it may be caused by a dilated heart. 3. Depression of the liver. In obesity the liver is apt to rise, although the area of pericardial dulness is increased. 4. Rotch's sign,—dulness in the right fifth intracartilaginous space; this may also be caused by enormous distention of the right auricle. 5. The lower angle of pericardial dulness projects towards the right; this can never occur as a result of cardiac enlargement. 6. The apex-beat is somewhat within and above the area of dulness of the left side in pericardial effusion, at the extreme limit of the dulness in the case of pericardial enlargement. In pericardial effusion the apex is never raised, occasionally, indeed, as a result of the depression of the diaphragm, it is lowered, but an impulse from the base may sometimes be felt in the third interspace. Among the thoracic signs may also be mentioned the great resonance of the upper part of the chest, the activity of the costal breathing, the bulging of the left half of the thorax, and the altered relation between the clavicle and the first rib. 7. The first rib sign: the upper edge of the first rib may be felt as far as the sternal attachment, but the rib continues to move with respiration, and is not fixed as in emphysema. 8. The posterior patch of pericardial dulness is found at the left inner base and extends laterally usually not quite as far as the angle of the scapula, and vertically to the ninth or tenth rib with an abrupt horizontal boundary, the patch being shaped something like a square. It is an area of partial dulness only and is pathognomonic. 9. Tubular breathing below the left mamma. 10. The posterior pericardial patch of tubular breathing and ægophony. 11. Secondary pleural effusion. 12. Large and slapping pulse. Of course, all these signs may be greatly modified by the presence of pericardial adhesions. [Ewart states, in giving a preliminary description of the normal area of cardiac dulness, that the area of relative dulness extends from one and a quarter to one and a half inches to the right of the right border of the sternum. Careful examination of the cadaver had convinced us that the heart, even when considerably dilated and hypertrophied, never extends as far to the right as this, and hence this area of dulness, as also agrees with our own clinical experience, is much too large.]

I. Small-Pox and Vaccinia: their Manifestations and Inter-Relations in Man and the Lower Animals. By S. Monckton Copeman, M.A., M.D., M.R.C.P.

II. The Composition and Action of Natural and Cultivated Vaccine and Variolous Materials. By John B. Buist, M.D., F.R.S.E.

III. The Accidents of Vaccination. By T. Colcott Fox, M.B., F.R.C.P.

IV. Compulsory Vaccination from a Legislative Point of View. By Edward Seaton, M.D., F.R.C.P.

V. Vaccination and Small-Pox Statistically considered. By E. J. Edwardes, M.D., M.R.C.P. (*Practitioner*, May, 1896.)

The May number of the *Practitioner* is devoted to vaccination, in honor of the Jenner centenary. The journal contains on its first page an excellent portrait of Jenner. And the five papers indicated above are of a high scientific and literary merit.

I. Dr. Copeman, in his studies of the action of vaccine and small-pox on the lower animals, has experimented largely on monkeys. Inoculations of vaccine and of variolous lymph have each given successful results in every instance in which it was tried on the monkey. Experiments were tried to determine the protective power against small-pox of humanized vaccine lymph, calf lymph, and of small-pox lymph. The experiments showed that the protective power of lymph obtained from these three sources is practically identical in all respects when inoculated on the monkey.

In specially-stained specimens of vaccine lymph, taken at a period antecedent to full maturity of the vesicles, minute bacilli can be demonstrated, often in considerable numbers and in practically pure cultures. These bacilli cannot be found, or are found only with difficulty, in mature lymph, for the reason, probably, that they have given place to spores. Eggs inoculated with variolous crusts gave, after a month, a pure culture of a bacillus which morphologically was not to be distinguished from the bacillus found in early vaccine lymph. This bacillus could not be grown in the ordinary culture media, but when inoculated into the calf it produced a vesicular eruption at the point of inoculation. From the first calf thus inoculated another was inoculated, and from the second calf a child was vaccinated, and the vaccination "did splendidly."

II. Dr. Buist has experimented with vaccine on monkeys. He has found in vaccine lymph four different-colored growths,—orange, brown, white, and yellow. A bacterium of constant form is to be found in clear vaccine and variolous lymph, and is probably the cause of vaccinia and variola; still, it seems to be practically impossible to reproduce the same bacteric form by artificial cultivation in solid media outside the animal body. The white, yellow, and orange vaccine cultivations grow directly from organisms in the lymph. The organisms in clear lymph are regarded as spores which develop into the larger forms when cultivated in solid

media. Clear vaccine and variolous lymph, therefore, contain spores of bacteria in suspension, which are distinguished from the micrococci of cultivation by their characteristic difference in size. In the same way opaque lymph, which is an imperfect material for vaccination, may be regarded as a natural cultivation of the organisms existing in clear lymph. This natural cultivation is the cause of opacity of lymph. The discovery of yeast-forms in opaque lymph led Dr. Buist to inoculate monkeys with ordinary yeast, and on carefully studying the results of successive fermentation, variolation, and vaccination of monkeys continued in various orders, he concludes that yeast inoculation modifies the action of both the variolous and vaccine contagia.

III. Dr. Fox divides the accidents of vaccination into several groups. In the first group he considers all those deviations from the typical evolution of the vaccine vesicle, and from the normal accompanying symptoms, which are not due to impure lymph, to the idiosyncrasy or special constitutional condition of the subject, or to imperfection in the details of the operation. In this group he includes abortive, tardy, spurious, too rapid evolution of the lesions, and abnormal size of the lesions; recrudescence, super-numerary vesicles, generalized eruption of vesicles, "raspberry sore," cheloid, dermatitis, swelling of the axillary lymphatics, and ulceration. In the second group he treats of the incidental exanthematic eruptions. In the third group are included the diseases (chiefly of a septic nature) which find a nidus in the wounds subsequent to the operation. These are in many respects the most formidable, and are for the most part quite preventable. In the fourth group the diseases inoculated with vaccinia at the time of the operation are treated of,—syphilis, leprosy, and tuberculosis. That syphilis may be communicated is fully recognized. In the fifth group diseases excited in subjects specially predisposed to them are treated of.

IV. Dr. Seaton believes that such an amount of moderate compulsion as constitutes "a system" cannot be dispensed with without serious public danger. Primary vaccination, well carried out, is an absolute protection for infants and young children. The principle of compulsion in the sense of superseding the rights of parents in this matter has never been thought of by the legislature. What the promoters of vaccination have endeavored to secure in the past and wish to maintain in the future is the early vaccination of practically the whole of the infant population. It would be impossible to secure such an end without some amount of moderate compulsion. Without systematic primary vaccination epidemics would pass out of all control. The necessity for revaccination of those who are brought within the immediate sphere and risk of small-pox is to be taken for granted, but systematic revaccination is not necessary. If reasonable facilities are afforded to public sanitary authorities to provide proper means of isolation of initial cases in epidemic outbreaks, the question of any extension of the principle of compulsion as applied to vaccination might be set aside altogether. As it is, the author would not be one of those to advocate it, be-

lieving, as he does, that the other measures of prevention would be found quite sufficient.

V. From the statistical consideration of vaccination and small-pox Dr. Edwardes draws the following lessons: First, vaccination in infancy, renewed at the end of childhood, renders an individual practically as safe from death by small-pox as if that disease itself had been survived in childhood, and almost as safe from attack. Second, with the present system in England more adults now die of small-pox than in the last century. Third, universal compulsory vaccination in infancy cannot prevent severe local epidemics. Fourth, compulsory revaccination is imperatively required.

J. M. S.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

Absorption of Drugs by the Healthy Skin. Application to Salicylic Medication. (*La Presse médicale de Belge*, March 29, 1896.) By MM. Linossier and Lannois.

At a meeting of the Academy of Medicine of Paris these authors recalled the fact that, in their experiments on the absorption of guaiacol, they had shown that the healthy skin is able to absorb a larger proportion of certain medicinal substances than the usual therapeutic dose. Recently they have experimented with salicylate of methyl, a substance which constitutes nine-tenths of commercial winter-green, and which, taken internally, possesses all the properties of salicylate of sodium in the treatment of acute articular rheumatism. Moreover, this substance is changed into salicylate of sodium in the blood. Salicylate of methyl applied to the skin is very easily absorbed. After the application of one drachm (four grammes) to the thigh of a patient, one to three grammes of salicylic acid may be found in the urine in twenty-four hours; it is also eliminated in large quantity by the intestine, as authors have been able to prove by the analysis of the faecal matter. The daily elimination of urine is regular in the course of prolonged treatment. There are no alterations in the skin. Salicylate of methyl, like guaiacol, is absorbed as a vapor. The technique of the cutaneous application of salicylate of methyl is the same as that used in painting with guaiacol. The liquid is applied with a brush, or uniformly spread, by the aid of a medicine-dropper, upon one of the limbs, usually the thigh. The painted area is covered with an impermeable dressing to prevent the diffusion of the vapors, and is surrounded by cotton to keep up a temperature favorable to volatilization. The dressing is kept in place twenty-four hours. One

drachm (four grammes) is the usual dose of salicylate of methyl. If one wishes to use a larger dose, it is necessary to spread the liquid on a gauze bandage, which is applied to the limb and which is capable of holding the liquid by absorption. The incorporation of the medicine with lard or with vaseline appears to diminish the absorption. The indications for painting with salicylate of methyl are identical with the indications for the use of salicylate of sodium. This method of administration has the advantage of not irritating the digestive tract, and is, at the same time, a remedy applicable locally to painful parts.

Theobromine. (*La Presse médicale de Belge*, March 29, 1896.) By M. Huchard, of Paris.

The author reaches the following conclusions regarding theobromine: First, theobromine is one of the most faithful diuretics; second, theobromine increases the action of renal epithelium without altering it; third, exceptionally (three cases in two hundred), when the kidney is diseased, an increase of albuminuria is noted; the increase being probably due to the absorption of the cedematous fluid of ascites; fourth, the clinical indications for theobromine are cardiac and renal sclerosis, arterial cardiopathies, and epithelial or interstitial nephritis; fifth, nothing is gained by associating theobromine with digitalis, caffeine, or lactose; sixth, the action of theobromine may be prolonged by the addition of one-sixtieth to one one-hundred-and-twentieth grain (one-half to one milligramme) of digitaline on the day on which the last dose of the former remedy is given; seventh, the diuresis started by theobromine is rapid; it appears during the first day; it persists three or four days; after the last dose of the drug is given it is abundant, and amounts ordinarily to five quarts (five litres); its effects are not cumulative; there are no accidents in which it fails to be of service; it may be prolonged, having regard to its feeble toxicity; eighth, theobromine may fail, but it frequently succeeds after the other diuretics have proved useless; ninth, the mean daily dose is from forty-five to seventy-five grains (three to five grammes); tenth, its use in infectious or toxic diseases (pneumonia, cirrhosis of the liver) seems to give good results by urinary depuration.

The Treatment of Diffuse Infantile Bronchitis by Warm Baths. (*Gazette des Hôpitaux*, March 26, 1896.) By M. Renaut, of Lyons.

In children, when the well-known physical signs of severe bronchitis are recognized, accompanied by a rectal temperature of 102.2° F. (39° C.) which is not accidental, there is danger of the passage of a bronchitis, already dangerous of itself, into a condition of capillary bronchitis, frequently fatal. Now, there is a therapeutic measure which is simple and, at the same time, devoid of danger by which this formidable capillary form of diffuse bronchitis may be nearly always avoided. This method consists in giving to the child a bath at 100.4° F. (38° C.), lasting seven or

eight minutes, every three hours, except when it is found that the temperature, taken three hours after the preceding bath, has not reached 102.2° F. (39° C.). The fever falls more or less rapidly, sometimes after the third or fourth bath, and does not recur, while the diffuse bronchitis becomes a slight bronchitis confined to the larger bronchial tubes. At other times the struggle is prolonged for four or five days, during which it is necessary to bathe the child systematically every three hours, day and night. This conclusion is formed after using the warm baths in more than one hundred cases, extending over a period of about ten years. The only accessory to this treatment that has been used is the regular employment of the sulphate or the hydrobromate of quinine. This remedy is used with no pretension of controlling the fever, but as a general tonic. When the bronchial inflammation has extended to the capillary tubes, the security possessed in the former case is lost, but, if the effects of warm bathing are compared with the results of the other forms of treatment called into play in bronchopneumonia, a number of chances of the cure of the patient are gained. Upon the subcontinued fever of capillary bronchitis increase of temperature will engraft itself once or twice a day; even hyperpyrexia may be noted. The temperature goes up rapidly to above 104° F. (40° C.), even to 105.8° F. (41° C.), soon to descend slightly. In the following days the increase of temperature does not appear at the same hour, and it is necessary to be on the watch, since the beginning of the febrile process corresponds to a period of extension of the disease, and it is necessary to give a bath as soon as the temperature rises, and to repeat the bath if the temperature remains high for an hour. The temperature of the water, in this case, is brought down to 95° F. (35° C.) or to 93.2° F. (34° C.), but the bath is never given cold. Sometimes in very dangerous cases it is necessary to continue this treatment during one, two, or even three weeks. As soon as the temperature takes the type of a subcontinued fever, instead of presenting accelerations twice a day, something ought to be considered as gained. The theory of warm bathing and its marked therapeutic effects in severe infantile bronchitis is still entirely to be worked out. It is evident that it does not act as an antithermic by refrigeration. It is much more probable that the bath acts upon the nervous system, producing an unfavorable condition for the growth of pathogenic micro-organisms, or for the formation of the poisons resulting from their battle with the defensive anatomical elements of the organism.

The Treatment of Gout and of Uric Gravel. (*Gazette des Hôpitaux*, March 5, 1896.) By X. Delmis, M.D.

The author recommends piperazine for these conditions. This substance is a crystalline organic base, soluble in water. The urate of piperazine is several times more soluble in water than the urate of lithia. Piperazine dissolves uric acid and uratic concretions in the proportion of half its volume. A number of physicians have proved that the first doses of

piperazine cause an abundant expulsion of gravel and small stones, at the same time that a relief of the pain is manifested. In acute gout piperazine causes a rapid amelioration of the pain and a progressive diminution of the swelling and redness. In chronic gout it appears to have an elective action upon tophi and upon the articular stiffness. The author has seen voluminous tophi disappear and deformed limbs assume an almost normal aspect, thanks to the persistent usage of the remedy which is possible by its harmless action upon the organism.

The Influence, First, of Repose and of Movement, Second, of Alcohol, of Cane-Sugar, of Mucilages, and of Starches upon the Absorption of some Medicinal Substances by the Healthy Stomach. (*Wratsch*, No. 40, 1895.) By M. P. Sokanovsky and P. Bezsonoff.

These two questions have been studied in the laboratory of Professor Tschondnovsky upon ten attendants aged from twenty-one to twenty-four years, in good health and under about the same conditions of life and diet. Iodide of potassium and salicylate of sodium were experimented with, as they could be found in the urine three or four minutes after their administration. M. Sokanovsky has studied the influence of repose and of movement upon absorption. Repose was absolute; when determining the influence of movement the subjects experimented upon walked rapidly or even ran. One hundred and twenty experiments were made with each drug, and, further, the author has made fifteen experiments upon twelve subjects relative to the influence of fatigue upon the absorption of medicines. He concludes: First, the rapidity of absorption of some medicinal substances by the stomach changes with the change of position. Second, absorption is slower when the subject is lying down than when he is sitting. Third, the retardation of absorption is shown not only by the later appearance of the medicine experimented with in the urine, but also by a longer interval between the first indication of its appearance and the presence of a very marked reaction of the substance. Fourth, the rapidity of absorption during movement varies with the nature of the movement. Fifth, absorption of the medicinal substance is more rapid when the subject is walking than when he is running. Sixth, this rapidity is shown by the quicker appearance of the first indication of the reaction of the given substance in the urine and by the shorter interval between the indication and the perfectly clear reaction. Seventh, the greatest rapidity of absorption is obtained by the aid of moderate movements; the rapidity of absorption is at its minimum when the subject is lying tranquilly. Eighth, absorption is delayed in fatigued subjects.

M. Bezsonoff has studied the influence of some of the vehicles used in the administration of iodide of potassium and of salicylate of sodium upon the rapidity of absorption of these drugs. These vehicles were thirty cubic centimetres each of distilled water, ten per cent. syrup, thirty, fifty, and sixty-five per cent. alcohol, mucilage of acacia diluted half or twice with

water, and sago water. The experiments were made in the morning, fasting. The author made two hundred and sixty experiments upon attendants, and sixty upon himself. He concludes: First, the absorption of the medicines from the empty stomach is rapid. Second, thirty or fifty per cent. alcohol hastens the absorption of the substances. Third, a stronger alcoholic solution retards this absorption. Fourth, cane-sugar, ten per cent., accelerates the gastric absorption. Fifth, mucilages retard it. Sixth, starches also retard absorption.—*Gazette des Hôpitaux*, March 3, 1896.

Thyroid Extract in Goitre. (*Universal Medical Journal*, April, 1896.) By Dr. Stabel.

Before the Berlin Medical Society Stabel gave the results of his experiments, in Professor von Bergmann's clinic, in twenty-six cases of goitre treated by thyroid medication. These results agree with those reported from other countries and are entirely favorable. The best effects were obtained by the use of the fresh gland, and Stabel believes that the tablets are not to be recommended, as he noted bad effects from their use in several instances. He reports the case of one man, fifty years old and quite obese, who took a large quantity of the tablets and who died in several days after from severe mental symptoms. Post-mortem examination showed acute œdema of the brain, probably following thyroidin-poisoning. In two other cases mental alienation followed the use of the tablets. Ewald stated, in the discussion, that he had obtained better results with the tablets than with the fresh gland, observing the most remarkable effects in young chlorotic girls suffering from parenchymatous goitre. Complete recovery, however, did not take place. He had noted but slight symptoms of thyroidism, as moderate albuminuria with casts disappearing as soon as the treatment was suppressed. Mendel obtained no improvement in ten cases in which he had tried the tablets. He was obliged to abandon the treatment on account of the palpitation and emaciation which it caused. He did not regard it as suitable for cases of Basedow's disease, in which there is a tendency towards emaciation. Senator also stated that he had not met with success by the method, which could only be expected to aggravate the symptoms of Basedow's disease, if the latter depend on an exaggerated function of the thyroid gland.

Lactate of Strontium in Nephritis. (*Medycyna*, No. 1, 1896.) By Bronowski, M.D.

The author has used lactate of strontium in three cases of acute parenchymatous nephritis, in six cases of mixed parenchymatous and interstitial nephritis, and in one case of interstitial nephritis. He does not agree with Dujardin-Beaumetz as to the favorable action of the salts of strontium on the kidneys through their diminishing putrefaction in the intestines. Direct experiments with bacteria convinced Dr. Bronowski that the anti-septic properties of lactate of strontium were insignificant, and that the

presence of ethereo-sulphuric acids in the urine was not influenced by the use of the drug.—*Universal Medical Journal*, April, 1896.

Creosote in Tuberculosis. (*Universal Medical Journal*, April, 1896.)

By M. Burlureaux, M.D.

In advocating the use of creosote in large doses in the treatment of pulmonary tuberculosis M. Burlureaux, before the Société Médicale des Hôpitaux, insisted upon two facts: (1) That the untoward symptoms caused by it, though apparently serious, are never mortal, and disappear within six or eight days without leaving any trace; (2) that such symptoms occur but rarely, since he had only observed them in three cases, though he had been using large doses for the past five years. Hence, there is no more reason for abandoning the drug on account of the accidents that it may cause than there is for abandoning any other active medicament. In the author's opinion, not to give the largest dose that can be tolerated in each individual case is to deprive the patient of the benefits of the treatment. The physician must decide the limit of the dose, guided by the various manifestations of intolerance.

In the discussion which followed, M. Faisans asserted that creosote had by no means the virtues of a specific, and that it was contraindicated in all cases in which there was fever, habitual dyspepsia, or cardiac erethism. It was true that large doses produced considerable improvement, especially in the body-weight; but the same result could be obtained by cod-liver oil in large doses with two hundred and fifty grammes of meat powder, according to M. Debove's method. In short, while creosote is one of the best balsamics and of great service in bronchorrhœa, it can in no way be admitted as a specific. MM. Ferraud and Lereboullet coincided with these views. M. Catrin expressed the opinion that creosote injections were seldom indicated, but often contraindicated. If a tuberculous patient has any tendency to erethism, creosote should be avoided. It may be of service in the beginning of the disease, in what may be called the latent stage, while of value in bronchial catarrh, it could not, to his mind, be looked upon as a specific. M. Fernet stated that hygienic factors alone could bring about a cure of tuberculosis of slow evolution. Among these factors was to be cited overfeeding, especially praised by M. Debove, the administration of alcohol, cod-liver oil in large doses, and the use of hydrotherapy. He also regarded creosote as contraindicated in the erethic form of phthisis, in alcoholic or gouty patients, or in those with arterio-sclerosis. M. Hanot had noted the disappearance of urobilin from the urine in twenty-eight patients treated by rectal injections of creosote, and he asked whether favorable effects of the administration of the drug by the rectum did not depend on the fact that its antiputrid action was exerted more directly. M. Hayem believed that creosote was always injurious to the digestive tract, especially in tuberculosis, as it is one of the most irritating of drugs and one of the factors in medicamentous gastritis. As regarded its action on urobilin, M.

Hayem has observed that in many patients showing a large quantity of the latter in the urine on entrance to hospital it completely disappeared after some weeks of repose, diet, and forced abstinence from alcoholic drinks.

Concerning the Value of Antipyretics. (*La Presse médicale de Belge*, April 19, 1896.) By M. Binz, of Bonn.

The author discusses under this head quinine, salicylic acid, antipyrin, antifebrin, thallin, and ethyl alcohol. Quinine acts by a direct depression of cellular activity, and not through its influence on the nervous system. This depressing action is manifested on the pathogenic cells of malarial fever as well as on the normal cells of the organism. The antipyretic action of the drug is, therefore, both local and general. Salicylic acid has properties analogous to those of quinine. It has an energetic antifermentative and antiputrefying action; it is not toxic; it is not destroyed in the human organism. The feeble chemical activity of its sodium salt is not an obstacle to its action in the organism, because the active acid is set free by the carbonic acid of the inflamed tissues. It differs from quinine, however, in having a different action upon the cells of the organism, an action which is analogous to that of the members of the following group. The antipyretic action of antipyrin is obtained by its influence on the central nervous system,—that is, upon the head-regulating centres situated in the brain. The characteristic of its antipyretic action is to weaken actual nervous excitation produced by the agent which caused the fever. Antifebrin, phenacetin, and thallin act in a more or less analogous manner. Thallin, however, must be credited with a direct destructive action on the organisms in the infective fevers. Alcohol has an appreciable action in lowering the temperature, particularly in the putrid or septic fevers. The causes of this action are many. The nervous system and the circulation are influenced. The excitation of the heart should also be considered, inasmuch as the circulation in the skin is increased and the heat dissipation is accelerated. Again, large doses of alcohol ought to act as an antiseptic agent on the organism, diminishing the vitality of bacteria. There is no post-mortem elevation of temperature in febrile animals which have been treated by large doses of alcohol. Finally, alcohol is a powerful diuretic, and thus there is an added possibility in its use of a rapid elimination of toxins which cause and keep up the fever.

Salol in Osseous Tuberculosis. (*Le Progrès Médical*, April 11, 1896.) By M. Reynier.

In cases of limited areas of osseous tuberculosis, operation would be performed sooner if one was certain of the limit of trephining. Now salol, which becomes liquid at a low temperature (104° F., 40° C.) and which will mix with iodoform, naphthol, etc., ought to be used for filling the bone. The hot liquid will penetrate the spaces of the spongy tissue, and will crystallize at about 80.6° F. (27° C.). In six cases the space in the bone left

by the removal of the diseased tissue has been filled with this antiseptic mass and the overlying tissues have been united. The injected matter remains in place without inconvenience. The opening which serves for the entrance of the mass does not need to be very large. In a patient who died two years after this treatment, it was shown that the injected substance remained intact. Salol acts, then, as a true antiseptic plug, which will give good results in limited areas of osseous tuberculosis.

Brazilian and Colombian Ipecacuanha. (*Pharmaceutical Journal*, April 25, 1896). By B. H. Paul, M.D., and A. J. Cownley.

The question as to the relative medicinal value of the two kinds of ipecacuanha now met with in commerce has acquired greater importance since the pharmacological observations conducted by Dr. Wild have shown that there is a well-marked difference between the effects produced by the two bases, emetine and cephæline, which are present in these drugs in different relative proportions. Emetine is a good expectorant, but cephæline does not appear to be equal to it in this respect, while, on the contrary, cephæline is undoubtedly superior as an emetic. A careful examination of selected samples of Brazilian and Colombian ipecacuanha shows that, although the total amount of alkaloid in the two kinds of ipecacuanha does not differ very materially, the relative proportions of emetine and cephæline are so different that these drugs cannot be regarded as interchangeable indifferently. In the root of the Brazilian variety there was 72.14 per cent. of emetine and 25.87 per cent. of cephæline; in the stem 65.6 per cent. of emetine and 32.8 per cent. of cephæline. In the Colombian variety there was 40.5 per cent. of emetine and 56.8 per cent. of cephæline.

Phenoleine. (*Gazette médicale de Liège*, April 2, 1896.) By M. Kossel and M. Albu.

Phenoleine in fact is only iso-butyl-phenol. The experiments made by M. Kossel upon dogs have demonstrated that it acts as an intestinal antiseptic, in so far as it excites contraction of the intestine and favors the expulsion of materials which would undergo the putrid fermentation. The disinfectant action ceases at the same time that the contractions disappear. The trials made on man by M. Albu have likewise shown the antiseptic action of phenoleine when it is associated with castor oil. On account of the known repugnance of this substance, M. Albu prepares an emulsion with castor oil and essence of mint. He has thus administered ten grammes of phenoleine in the space of ten days, and has reduced the putrid fermentation of albuminoid matters in the intestine to one-half or one-third. The appearance of phenomena of intoxication did not allow the administration of the remedy to be prolonged. M. Albu concludes that no practical utility can result from the use of naphtoleine, and that the surest method of obtaining intestinal disinfection consists in causing complete evacuation of the intestine and to have the patient take sterilized foods after that.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D.,
Assistant Demonstrator of Surgery in the
University of Pennsylvania,

AND

J. P. ARNOLD, M.D.,
Medical Superintendent of the Presbyterian
Hospital.

The Whole Duty of the Surgeon.—Commenting editorially upon the paper of von Nussbaum (1887), "On Some Unhappy Accidents in Surgery," the *British Medical Journal*, May 16, 1896, expresses its belief that the *religio medici*, like all religion, should include the rule of confession, and that such confession should be made to others, not secretly. It is a wholesome discipline, a sure method of teaching. It is good for a surgeon to find fault with himself: he should keep a note-book and daily record his work as if his worst enemy had done it. At the end of an operation let him review each stage of it, the most trivial inaccuracy should be noted. Important errors are not nowadays met with: it is the little things,—slight inaccuracies of incision, a moment's delay in tying an artery; let him contrast his fineness of touch with that of a watch-maker or a typesetter, his stitches with those made in fine needle-work. Since the discovery of anæsthetics most surgical operations are done without special skill, and in almost all some slight fault may be found. As von Nussbaum says, a single reverse has more teaching in it than ten successful cases. Students are quick to remember every criticism a surgeon passes on himself, and trust him all the more for it, while they tend to distrust him who seems always satisfied with himself, but finds fault with others. Recognition of one's errors and demerits is essential to practical improvement. If a surgeon will keep a daily record of his slightest faults he will find in it a sure way of improving his skill. "Live in your own heart," says Persius, "and you will find how scanty your furniture is." The editorial offers two suggestions in this connection: The essay of von Nussbaum is short, incomplete, and somewhat old-fashioned; and we want a full, fresh, careful account of the defects of surgery. Happily, grave errors are rare: it is the trivial faults, the slight mistakes of skill or judgment—many of them too slight to have the least influence on the result of the operation—that require to be set forth. The second suggestion is, that surgeons should publish less often isolated cases, and more often groups of cases, sets of consecutive operations, every example that has come under their care. This, says the journal, has been done by many surgeons,—Sir Spencer Wells, Mr. Knowsly Thornton, Mr. Herbert Allingham, and others. The method may be studied in such works as Bardeleben's "Klinik," or in hospital reports. The confession and record of imperfect work, and the publication of consecutive rather than isolated cases, are a sure way to improve the details of operative surgery.

Nephrectomy in Tuberculosis of the Kidney.—E. Müller (*Hospitals-Lidende*, No. 20, 1895) reports the case of a man, aged thirty-five, who for three years had suffered from symptoms of renal disease; the urine contained a great quantity of pus and numerous tubercle bacilli. The right kidney was enormously swollen. Pyelotomy was performed on this kidney and a large quantity of pus was emptied. After this operation pus was constantly discharged through the wound without any mixture of urine, the diuresis continuing to be very fair (twelve hundred grammes daily). A month later the diseased kidney was removed and the general condition of the patient now improved immensely; six months later the patient felt perfectly well and his urine was quite normal. Except for some nodules in the epididymis there were no other signs of tuberculosis in the other organs.—*Universal Medical Journal*, April, 1896.

A New Apparatus for Immediate and Permanent Drainage of the Urinary Bladder after Suprapubic Cystostomy. (*Bulletin of the Johns Hopkins Hospital*, April, 1896.) By Joseph C. Bloodgood, M.D.

The apparatus consists of a rubber-bag reservoir which holds about three hundred and fifty cubic centimetres of urine. Sealed to the upper and central portion of the bag is a thicker piece of rubber with a small opening in the centre, into which the head of the tube is inserted. The ends of an abdominal belt are also fastened to the centre-piece. The abdominal belt carries the entire weight of the bag, so that there is no dragging on the tube. Two rubber tubes lead from the bag, the lower one being used to draw off the urine and the upper one to wash out the bag; both are provided with stoppers. When the apparatus is used for immediate drainage, it is not necessary to change the position of the patient to empty the bag, and when the patient is up the bag can be emptied with no more than the usual unfastening of the clothes. The tube used for immediate drainage is made of hard rubber and consists of three pieces: one piece is shaped like a bolt, the head of which is inserted into the hole of the bag, the elasticity of the rubber making a snug fit. The second piece is screwed onto the bolt so that the rubber bag is held very tightly between the head of the bolt and this piece and leakage is prevented. The straight portion of the tube has a shoulder 1.5 centimetres from the bladder end which is pierced by four holes. The tube is first fixed in the bladder and then the bag armed with the bolt and second piece is screwed into the end of the tube. After opening the bladder, four silk sutures are passed through the wall, not including the mucous membrane, the inner piece of each suture being passed through the corresponding hole in the shoulder of the tube. The tube is inserted into the bladder and the sutures are tied. Gauze is packed down to the bladder about the tube, filling the suprapubic wound. The object of the gauze is to abort any leakage which might take place during the first few days. It may not be necessary, yet it is a safeguard against infection by extravasated urine and aids in holding the

tube in place. The tube for permanent drainage is not provided with a shoulder. It should be long enough to extend at least one centimetre into the bladder. The bladder end should be slightly bulbous, and the tube should be curved or straight, according to the direction of the sinus. The second piece rests on the abdominal wall. The apparatus for immediate drainage will work perfectly for eight days; at this time the sinus leading into the bladder will be lined by firm granulations, the bladder will be fixed by adhesion, and the wound will be in an excellent condition for the introduction of the tube for permanent drainage. For two or three days, until the sinus has contracted about the new tube, some leakage will take place, but most of the urine will be collected in the rubber bag.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D.,
New York City,

AND

WM. G. SPILLER, M.D.,
Philadelphia.

A Case of Acromegaly with Autopsy. Tumor of the Pituitary Body. (*Boston Medical and Surgical Journal*, April 23, 1896.) By W. L. Worcester, M.D.

This case presented the usual appearances of acromegaly during life, and at the autopsy the pituitary body was found much enlarged, rather soft, of a grayish color and smooth surface. It weighed fifty-eight grammes and measured 4.6 centimetres in its longest diameter. Microscopical examination showed it to be composed of spindle-cells supplied with numerous thin-walled blood-vessels, and revealed many calcareous nodules of a concentric structure. Not a trace of the normal tissue was to be seen.

In the statistics given by Sternberg, in 1895, of nineteen cases of acromegaly, all presented some change in the pituitary body. Dr. Worcester has found the reports of six additional cases; in only one of these the hypophysis appears to have been found unaltered.

Chronic Anterior Poliomyelitis as the Cause of Chronic Progressive Atrophic Paralysis in Diabetes Mellitus. (*Berliner klinische Wochenschrift*, March 9, 1896.) By M. Nonne, M.D.

The writer mentions seven cases which establish beyond a doubt the existence of chronic anterior poliomyelitis, and adds another in which diabetes had also been present, and which he believes demonstrates the fact that diabetes mellitus may be the cause of chronic degeneration of the motor portion of the cord.

In his patient the atrophy began in the shoulder musculature, involved

later both arms in toto, and extended to the lower limbs. Death was due to broncho-pneumonia.

Throughout the cord, from the cervical to the lumbar region, there were found degeneration of the cells and fibres of the anterior horns, secondary atrophy of the anterior roots, and moderate non-systemic rarefaction of the fibres in the anterior and lateral columns and median portion of the posterior columns, with slight increase of the neuroglia in these parts. Atrophy was noticed in two nerves and three muscles examined.

Dr. Nonne mentions the many manifestations due to the involvement of the nervous system in this disease, especially the diabetic neuritis, and claims that his is the first case of diabetes mellitus in which the diagnosis of chronic anterior poliomyelitis has been confirmed by autopsy.

The poison of diabetes, like lead and alcohol, may act on the motor cells as well as on the peripheral motor nerve-fibres.

The absence of changes worthy of note in the vessels of the cord does not strengthen the theory of vascular disease as the cause of nervous phenomena in diabetes. The rarefaction of fibres in the white matter may have been due to destruction of tract-cells. Cirrhosis of the pancreas in this case led him to infer that the diabetes may possibly have been due to this cause.

Left-Sided Paralysis of the Face, Tongue, Throat, and Larynx in Consequence of a Focus of Softening in the Right Centrum Semiovale. (*Neurologisches Centralblatt*, No. 5, 1896.) By Adolf Wallenburg, M.D.

A man of forty-seven had had insufficiency of the aorta for several years; bilateral myosis, reflex pupillary rigidity, and right-sided abducens paralysis for about twelve months; dementia, headache, attacks of dyspnoea, and vomiting for a still shorter period. His condition had remained unchanged for several months, when, within three days, inability to swallow developed, with entire paresis of the left seventh nerve, paresis of the left side of the tongue, of the left side of the larynx, and to a less degree of the elevators of the left shoulder, oedema of the left conjunctiva and left upper lid, and the formation of two tumors on the left side of the head. There was no reaction of degeneration; merely diminution in response to both currents in the paralyzed muscles. Motion and sensation were not affected in the trunk and extremities.

Under mercurial treatment the tumors disappeared and the paralysis improved. Death occurred after three weeks.

The paresis of the left facial nerve, of the hypoglossus, vagus, accessorius, glossopharyngeus on the left side, without involvement of the extremities, indicated an affection of the left side of the medulla, probably syphilitic, or some growth on the basilar process similar to those on the head.

The oedema of the left eye might have been due to pressure on the

sinus cavernosus. There were no signs of aneurism to explain the paresis of the left side of the larynx. The opinion has prevailed that a lesion in one cerebral hemisphere can cause only bilateral laryngeal paralysis.

Contrary to the diagnosis of a basal process were absence of choked disk, of reaction of degeneration, of involvement of the acoustic nerve, and of the nearly simultaneous development of the paralyses within a very short period without previous symptoms of irritation.

The autopsy justified the diagnosis of chronic syphilitic leptomeningitis based on the symptoms of myosis, pupillary rigidity, paralysis of the abducens, progressive dementia, and headache. The right abducens was found embedded in a mass of tissue and atrophied. A focus of softening was also found in the white matter of the right frontal lobe, probably due to thrombosis of the first branch of the Sylvian artery. This lesion, according to Dr. Wallenburg, explains the unilateral laryngeal paralysis as well as the paralysis in the face, tongue, and pharynx. The gyrus behind the ramus ascendens of the right Sylvian fissure, together with the adjoining part of the anterior central (and possibly of the posterior central) and of the third frontal gyrus, contains motor centres for the entire musculature of the left side of the face and tongue, as well as for the muscles of mastication and swallowing.

Brissaud places the larynx centre in the "opercule frontale," between the ramus horizontalis and ramus ascendens. In this case of pseudobulbar paralysis the lenticular nucleus was in no way involved.

Diplegia Facialis. (*Neurologisches Centralblatt*, March 15, 1896, No. 6.) By L. E. Bregman, M.D.

Dr. Bregman refers to some interesting facts observed in paralysis of the seventh nerve. The upper branch is said to be unaffected in supranuclear and nuclear lesions, but it has been shown to be involved, although to a less degree, in central paralysis; on the other hand, peripheral paralysis not seldom affects the orbiculo-frontal branch to a less extent. In bulbar paralysis the contrast offered by the upper and lower parts of the face is usually striking; cases of this disease are recorded in which the upper branch was also involved. Nuclear diplegia with involvement of the complete seventh nerves may occur independent of progressive bulbar atrophy, and as absence of reflexes, change in the electrical reactions, and equal paralysis of the movements of volition and expression, may be observed in the peripheral as well as the nuclear form, the diagnosis may be very difficult. If the sixth nerve is also altered in its function, the lesion is probably nuclear, but may be peripheral.

It is claimed that when the seventh nerve is diseased below the geniculate ganglion and above the exit of the chorda tympani taste is affected on the anterior two-thirds of the tongue, but Stintzing has shown that, as the chorda fibres reach the brain in the fifth nerve, lesion of the fifth nerve or its centre

may cause disturbance in this sense. In such a case sensation need not be altered.

Gowers, Jackson, etc., have claimed that the soft palate is not involved in isolated paralysis of the seventh nerve. Dr. Bregman reports a case followed by autopsy in which the soft palate was not involved, and yet the facial paralysis was due to tubercular basal meningitis.

In most cases of diplegia facialis the paralysis is usually symmetrical, but is not always so. On one side the lesion may be supranuclear, on the other peripheral, or a large lesion in the pons may involve one seventh nerve previous to decussation and the other after, or a focus may be exactly at the decussation of the central fibres of the two nerves. It is not demonstrated whether a single cortical lesion can cause prosopodiplegia.

Apart from progressive bulbar paralysis the most common causes of diplegia facialis are syphilitic affections shown as basal meningitis, endarteritis or foci of softening in the pons, more seldom fracture of the base of the cranium or double otitis media, and exceptionally infection or the so-called rheumatism.

Dr. Bregman reports a case of diplegia facialis which was probably peripheral and rheumatic in nature. Electrical reactions were not changed until the third week,—a statement which must make prognosis guarded in the early stages. Disturbance of sensation in facial paralysis is probably due to involvement of the sensory fibres in the seventh nerve.

Concerning Localization in the Oculomotor Centres. (*Wiener klinische Wochenschrift*, January 30, 1896, No. 5.) By Stefan Bernheimer, M.D.

Dr. Bernheimer extirpated certain ocular muscles innervated by the third nerve and investigated the changes in the nuclei by the method of Nissl. He noticed,—

1. Changes in the nuclei twelve to fifteen days after the operation. The period required was longer than that stated by Nissl as necessary for such alterations in the nucleus of the seventh nerve after a similar experiment.

2. These changes occurred only when the muscle was entirely extirpated and not merely cut through.

3. They were similar to those stated in the description given by Nissl for the seventh nucleus. The chromophilic elements and the cell-nuclei were involved. The cells became round, the processes were less distinct or absent. Fourteen days after the operation little was to be seen of the structure, and the cell-body appeared almost homogeneous. The degenerative process was not equally advanced in all diseased cells.

4. When all four external muscles innervated by the third nerve were destroyed in a rabbit and the nuclei examined fourteen days later in a series of forty-five sections, counting from behind forward, a great number of altered cells were noticed on both sides of the median line in the first

thirty sections, and these were more numerous on the side opposite the lesion. In the proximal end of the centre the degenerated cells were less numerous, and in the last eight or ten sections only normally-formed cells were found.

It appears that in rabbits the four external ocular muscles innervated by the third nerve have their centres in the distal and middle portions of the oculomotor nucleus, and especially in the contralateral side, whereas the cells for the internal ocular muscles are located in the most proximal portion.

Diffuse Meningo-Myelitis in Tabes, General Paralysis, and Spinal Syphilis. (*Archives de Neurologie*, 1895.) By J. Nageotte, M.D.

In tabes, general paralysis, and spinal syphilis, there are diffuse, vascular, and connective-tissue lesions, with special involvement of the veins, which, by greater intensity at some one part of the nervous system, produce one of these three diseases. In tabes the morbid process is neuritis of the posterior roots (see December number, 1895, of the *INTERNATIONAL MEDICAL MAGAZINE*), in general paralysis it is meningo-encephalitis, and in spinal syphilis it is meningo-myelitis.

Four cases with histological examination are reported, one of general paralysis, two of tabes, and one of tabes with general paralysis. All four presented diffuse meningo-myelitis, and three meningo-encephalitis; in one a distinct circumscribed patch of myelitis was found. In five cases of pure general paralysis and in six associated with tabes, Dr. Nageotte has noticed meningo-myelitis. He considers this a constant condition in tabes. He has found the infiltration of round cells greater in the meninges than about the vessels in the cord. To judge from his cases the posterior part of the meninges is not more involved than the anterior, although the opposite condition has been stated as occurring in tabes. The lesions are the same as those found in spinal syphilis. This meningo-myelitis is not the cause of tabes, though it may produce destruction of fibres and give rise to symptoms, especially when localized in a distinct patch, as in Case No. IV. of his paper. It is undoubtedly due in the great majority of cases to syphilis. Possibly tuberculosis may cause diffuse lesions histologically similar to these described, but it is a question whether the development of the process is the same.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

The Tsetze Fly. (*British Medical Journal*, May 16, 1896, Editorial.)

The tsetze fly (*Glossina morsitans*, Westwood) was first accurately described by the great traveller Livingstone. It has long been believed that this fly was, if not the cause, at least the principal medium for the distribution of the disease with which it was apparently associated. It is a dipterous insect, slightly larger than the common domestic fly, and is provided with powerful maxillary apparatus by which it penetrates the skin and sucks the blood of the lower animals and even, traversing the clothes, of man himself. Being a voracious blood-sucker, searching its food from one animal to another, it is an effective medium for the transmission of the germs of blood-diseases. It has a wide distribution, being found almost over the whole of Central Africa, abounding also to the north of the Transvaal and on the right bank of the Zambezi; it is also common on the low country between the Ougogo and the eastern shore of the continent. It shuns villages and cultivated districts, preferring the borders of swamps and, woody places; its existence and distribution depend, curiously enough, on the presence of large game. The goat, the buffalo, the antelope, the zebra, and man are not seriously affected; but the dog, the ox, the sheep, the ass, and the horse, when bitten by it, are doomed to almost certain death. Travellers relate how large herds of oxen have perished, and how, in this way, it is a serious obstacle to the settlement and civilization of the dark continent. The nature of the poison supposed to be introduced by the tsetze fly has hitherto been unknown. Livingstone suggested that it might be derived from the secretion of certain glands which are a prominent feature in the anatomy of the insect. Others have thought that it might be a germ of some sort. Others, again, have denied that the fly was in any way the cause of the disease associated with its presence, known as "fly-disease." It would now seem that natives, and to a certain extent Livingstone also, were right as to the relationship of the fly to the disease, though wrong as to the nature of the virus. Surgeon-Captain David Bruce has shown that the true cause of the tsetze-fly disease is not any secretion or property of the fly itself, the insect being merely the passive agent for conveying a living virus from infected to uninfected animals. This virus he shows to be a protozoon, closely resembling, if not identical with, the *trypanosoma evansi*, the acknowledged cause of the surra disease of India. Bruce has also shown that the tsetze fly, having fed on the blood of an affected

animal, can, in feeding upon an unaffected animal, introduce the trypanosome with its bite, producing death, with a high degree of anæmia, accompanied by wasting and dropsical swelling, preceding the fatal issue. Bruce asserts that the tsetse fly does not lay eggs, but gives birth to a living larva which immediately seeks to bury itself in the ground. The natives claim that the proper habitat of this larva is the dung of the buffalo. If this be true, it explains the fact that "fly-disease" vanishes with the disappearance of large game from a given district.

Bruce's discovery, says the editorial, will draw attention once more to the part played by insects, particularly blood-suckers, as factors in pathology. The rôle of the mosquito is beginning to be recognized; that of the tsetse is now established, and possibly, before long, other blood-suckers will be found to possess similar properties, either as active agents in the biological cycle of disease-germs, or as media for their conveyance from one human being or from one animal to another, as in the case of the tsetse fly. It is hoped that encouragement and opportunity will be given Dr. Bruce to continue his investigations.

Danger to the Cause of Sanitary Reform. (Abstract of a paper read before the Pennsylvania State Medical Society.) By Prof. J. W. Moore, M.D.

This physicist and physician is of the opinion that there is a real danger to the cause of sanitary reform from a too hasty acceptance of theories which result in proposing, adopting, and enforcing regulations which are a hardship to the people without accomplishing good. Every regulation founded upon theories which have failed to stand the test of scientific examination reacts in the minds of the voters to the detriment of the cause. Having these views, he showed the weak places in the modern theory of the origin and dissemination of contagious diseases. He claimed that evidence from clinical, bacteriological, and epidemiological sources must agree, and that in particular diseases they do not. Science is often retarded by the expression of opinions by learned men. Newton himself is responsible for the backwardness of the science of optics. We must avoid the confusion of coincidences with similarities. The old proofs of contagion are not obsolete; truth never is. But in the case of tuberculosis, for example, they will not apply, because the disease is too old, the distribution too wide, and the cases too chronic. The modern theory of the parasitic origin of disease is fascinating, and has many points which appeal to our minds by their truthfulness. The researches of Koch, Pasteur, and others have opened a boundless field for investigation. Let us honor them always. In this department of science as in others the disciples with less knowledge claim more than their masters. Koch, for example, insisted upon four postulates; many of his followers accept contagion on even one; some on none proved. These postulates have become rather ancient history, but Koch was right; they are not axioms which are self-evident but postulates, the truth of which may be denied. In

the mean time other questions have been opened up which make the investigation still more difficult. The crucial test of the theory is the reproduction of the exact disease in man; this has not been effected.

The results of a laboratory experiment cannot be predicated of an experiment performed by Nature in her own way; so many new conditions are introduced that to conclude from the first that the second will show the same outcome is absurd.

The possibility and the probability of infection must be distinguished when the question of actual contagion is taken up for discussion. The conditions are so different that the experiment is practically not the same. The same disease is not equally contagious under the same apparent circumstances; the same disease is not equally communicable to different persons nor to the same person at different ages. Hence all contagious diseases are not to be subjected to the same regulations.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

VISITING LIST OF A PHYSICIAN AS EVIDENCE IN SUPPORT OF HIS CLAIM FOR PROFESSIONAL SER- VICES.

THE book entries of a physician or surgeon, if made at the proper time and itemized as minutely as is required in the case of a merchant, may be properly received as evidence to prove a claim for medical services; but a physician's visiting list containing simply a name with a succession of hieroglyphics, to be explained only by the person making them, who, in this case,¹ was the physician himself and an incompetent witness, inasmuch as his patient against whose estate the claim was sought to be established was dead, is clearly inadmissible as a book of original entries to prove a claim for such services against the estate of such decedent.

This was the rule of evidence applied in *German's Estate*, and it has since been followed in Pennsylvania. Ashman, J., in passing upon exceptions taken to this ruling, said, "The rule of evidence which introduces a tradesman's book of original entries to prove his sales, is permitted to override the principle that a party may not manufacture evidence for himself, on the ground of convenience. It cannot be said to have been dictated by necessity, because in England, where these books serve only as

¹ *German's Estate*, 16 Phila. 318 (1883).

memoranda from which the party producing them may refresh his memory, it has been found that all the advantage, without any of the danger incident to this character of proof, is obtainable. For the reasons which justify its use in the case of a merchant, it has been so far extended as to embrace, perhaps, the books of any person whose business is not in money, and is of such a nature that its transactions can be itemized with the precision with which a sale may be recorded. It is perfectly consistent with this broad statement that a doubt should have been expressed in *Hale's Executors vs. Ard*,¹ whether the books of an attorney containing charges for advice are evidence. Such entries, as was there said, must be incapable of certainty in description, because the services themselves are indefinite in their nature, and can neither be gauged by the time they occupy, nor compared with other similar services with which a jury is supposed to be acquainted. But this objection can scarcely be said to apply to the record kept by a physician. It may cover a daily entry of each visit, with the name of each patient, a list of the medicines furnished, and the price which custom has fixed for the particular service. Such a record will comprise all the incidents of certainty of time, person, labor, and value, and each entry will be complete in itself. No more than this is required in the books of an artisan, and the measure of necessity is at least as great in the one instance as the other. If the proposition has been correctly stated, it affords an easy test of the validity of the proof submitted by the claimant. His diary or visiting list, as a physician, contained on each page a list of names of patients, with tally marks opposite, in columns which were headed separately with the days of the week; the name of the month appearing at the top of the page, and the date of the year on the cover. One column at the end of the space for each week was headed 'Amount.' Preceding these lists, as a sort of preface to the book, was a 'Table of Signs.' This table embodied a series of hieroglyphics and figures, which were intended to denote visits made and to be made, and visits repeated or to be repeated; consultations proposed or made; services at the office; visits at night; medicines furnished, and the like. It is quite clear that entries patterned after this fashion could serve, at best, only as memoranda from which to make more formal charges. As original entries, even if decipherable, they were incomplete, because their form admitted only of a weekly charge in money, and, in point of fact, no charge at all appeared to have been made. Allowing the utmost latitude to the plea of convenience and necessity, the law cannot tolerate as self-proving an entry of services which can be translated only by means of a glossary. Such writing would be as unintelligible to any ordinary jury as a Hebrew bible to a deputy sheriff. The auditing judge, therefore, properly threw it out of the case. The sum which he finally awarded the claimant, we think, was all that was shown by the oral testimony to be due."

¹ 12 Wright, 24.

And, in a recent case,¹ Hanna, P. J., in following the law as above laid down, said, "The physician, the claimant, was, through his own want of care and forethought, unable properly to prove his claim for medical attendance and services to the decedent. By reason of the death of the latter, the claimant was incompetent to testify as to matters occurring in the lifetime of his late patient, so far as related to his own claim. This he must be presumed to know, and a due regard for his own interest should lead him to keep a book of original entries, showing a charge for attendance, with the date, the name of the person against whom the charge is made, and the amount of compensation for the services or attendance. If this had been done, the book properly and regularly kept, supported by the testimony of the claimant or his clerk who made the entries, will be *prima facie* evidence, and thus far sustain the claim. But, on the other hand, the physician relied upon what is known as a 'visiting list' to prove the number of his visits, and the parol testimony of experts to show their value. Such a book, containing simply a name, accompanied by a succession of hieroglyphics, to be explained and translated only by the person making them, who, as shown, is an incompetent witness, is clearly inadmissible as a book of original entries."

And the judge continues, with some emphasis, "It is a matter of surprise that physicians are so lax in this respect, and the present case furnishes an illustration of the danger of depending upon that which is simply a memorandum book for their own information and to refresh their recollection. In fact, in the case before us, if the testimony of the niece of the decedent had not been attainable, the claim would be entirely without support, and this alone prevented its entire rejection. We think the claimant should, under the circumstances, be content with the allowance made to him by the auditing judge."

The rule excluding physicians' visiting lists, as books of original entry, as applied in Pennsylvania, prevails, perhaps, in the other States of the Union, except Mississippi.

¹ Kelley's Estate, 5th Dist. Rep. 283 (1896).

BOOK REVIEWS.

OBSTETRIC ACCIDENTS, EMERGENCIES, AND OPERATIONS. By L. Ch. Boisliniere, M.D., LL.D. Philadelphia: W. B. Saunders, 1896.

This volume is intended for the practitioner, to guide and assist him in meeting obstetric emergencies. Part I. discusses "Accidents to the Woman," and contains chapters upon abortion, puerperal hemorrhages, adhesions and retention of the placenta, and inversion and rupture of the uterus, obstacles to labor, the uncontrollable vomiting of pregnancy, the induction of premature labor, sudden death in labor, puerperal convulsions, puerperal insanity, displacements of the pregnant uterus, and dropsy of the amnion and hydatiform mole. Part II. deals with the "obstetric operations." Part III. discusses "accidents to the child." The author follows the French school of obstetrics, most of his references being made, as stated in the preface, to "French authorities, because the art and science of midwifery originated in France, where they still hold a pre-eminent rank."

The purpose and scope of this book are commendable, since the practitioner cannot too frequently have impressed upon him sound doctrines and explicit directions to meet the emergencies of obstetric practice with skill and judgment. We regret to say that in some respects the present volume is not all that it should be. A few quotations will suffice to indicate that its teaching is not modern, and not always to be relied on. When discussing the preventive treatment of abortion the author says, p. 29, "In plethoric patients, with a strong vibrating pulse, good results have been obtained from a venesection of moderate amount. From eight to ten ounces of blood may be taken from the arm" (Depaue).

Plugging the uterine canal with cotton steeped in a strong solution of perchloride of iron is recommended for the treatment of abortion, and the curette is not to be used until a fetid discharge occurs.

After removing an adherent placenta at term "quinine and brandy should be administered freely to guard against septicæmia" (p. 57). Incomplete laceration of the perineum is defined as one beginning at the vulva that does not involve the sphincter of the anus, and, page 81, the following appears: "Incomplete lacerations do not require any particular treatment, as they heal spontaneously. The lower limbs ought, however, to be kept together for a week by means of a napkin or bandage tied around the knees, the woman being on her side; cicatrization then sometimes takes place by first intention, and sometimes after suppuration. In this case it is not necessary to use any suture; a few touches of nitrate of silver may promote healthy granulation."

It is unnecessary to point out other errors in teaching. In some respects the book is commendable, but it contains so much that is old that it will require a trained obstetrician to select the wheat from the chaff. Very often the advice of various French obstetricians is given at great length, and the practitioner surrounded by wealth of advice is at a loss to know which plan of treatment he should select. Directions for treating accidents and emergencies, in whatever branch of medical practice they may occur, should above all things be reliable as well as clear, concise, and practical. In many respects the present volume lacks these qualities.

R. C. N.

ATLAS OF TRAUMATIC FRACTURES AND LUXATIONS, WITH A BRIEF TREATISE.
By H. Helfferich, M.D., Professor at the University of Greifswald. New York:
William Wood & Co.

This book is one of Wood & Company's series of Medical and Surgical Atlases. It contains one hundred and forty-two pages and is embellished with fifty-six plates, each containing one or more cuts. The drawings present the principal types of fractures and luxations and their most common mode of treatment. The anatomical relations of the bones with the muscles, the blood-vessels, and the nerves are graphically stated. A glance at the plates affords a theoretical and practical study, each one explaining itself. The sections of the Atlas are prefaced by a short, condensed, and at the same time very complete description of the most classical mode of treatment. The author of this book, who is a recognized authority and an excellent teacher, understands the useful advantage of condensing the wide-spread field of fractures and luxations into a narrow compass. The book will undoubtedly meet with approval and appreciation not only from the student, but also from the practitioner who may seek to review rapidly the important field of bone and joint injuries, and thus impress his mind with the most typical pictures of those disorders. It will also serve as a valuable book of reference.

G. E. R.

THE THERAPEUTICS OF INFANCY AND CHILDHOOD. By Dr. A. Jacobi, Clinical Professor of the Diseases of Children in the College of Physicians and Surgeons (Columbia University). Philadelphia: J. B. Lippincott Company.

This book, dedicated to the author's co-operator and assistant, Dr. F. Cooper, contains five hundred octavo pages. The name of Jacobi alone is a sufficient guarantee of the excellent classical and practical arrangement of their contents. His experience of forty years, here recorded in a masterly manner, renders him very well fitted to furnish the profession, and especially the busy practitioner, concise and reliable information regarding the care of children in health and disease.

The contents are comprised in sixteen chapters, the first three of which are devoted to general therapeutic views and measures; the remaining chapters relate to the treatment of special diseases, the whole being closed with an appendix and index. Chapter I. is devoted to the dietary of sick children. The author points out as a principal rule that it is less important for the physician to discover what the child eats than what it is able to digest. The prophylactic value of his dietetic and hygienic rules is at once apparent, and, as the best cure, should particularly impress the physician. He also considers as a very important factor the exact and skilful appliance of a tasty drug. His statement of the diastatic effect of the salivary glands and the temporary appearance of lactic acid and free hydrochloric acid in the stomach, and, furthermore, the nutritive benefit the organism derives from water, sugar, starch, fat, casein, etc., is most interesting. The dietetic rules, especially in acute and chronic gastro-enteritis and in constitutional diseases due to special or general nutritive disorders, are very exact, and abound in scientific principles and practical suggestions.

The newly-born—the subject of the next chapter—are treated upon from birth to the age of six weeks. The information regarding the treatment of asphyxia, atelectasis, ischæmia, hæmaturia, sclerema, and concerning bathing, the treatment of the cord, umbilicus, and icterus, are all very valuable. The author then passes to Chapter III., which contains the rules of general therapeutics. He emphasizes most earnestly the fact that prophylaxis is the chief factor in the care of children. He then proceeds naturally to speak of the hygiene for school-children. Bathing, cold washing, exercise, sufficient remission of the hours of study, he thinks are subjects of great importance. The best exercise for a child he thinks is play,—less books and more fresh air, with large play-grounds,—these are good preventives of disease. The author cautions against too large doses of medicine. The subcutane-

ous administration of drugs is then explained. In the fourth chapter constitutional disorders are discussed. The author describes scrofulosis separate from tuberculosis. He advocates the extirpation of scrofulous glands. The infectious diseases are considered in Chapter V. He gives strict indications for the use of warm and cold baths, and considers antipyretics. He says what quinine is in malaria antitoxine is in diphtheria. Worthy of note, furthermore, is the author's statement regarding acute rheumatism, which he declares is a relatively frequent disease with children. Several pages are devoted to the sanitary regulations in connection with infectious and contagious diseases. Chapter VI. relates to diseases of the digestive tract, and paranephritis, hernia, liver-disease, etc. With the same exactness he discusses the dietary, medical, electrical, and mechanical treatment of these maladies, pointing out always the measure which has proved most serviceable in his own experience. In Chapter VII. genito-urinary diseases are considered, followed in Chapter VIII. by diseases of the respiratory organs. Here he recommends O'Dwyer's intubation. He condemns the use of antipyretics in pneumonia, if the daily remission of fever is not well marked. No bathing if the extremities are cold. In collapse he recommends digitalis, strychnine, and nitro-glycerin. The treatment of empyema is explicitly indicated. In Chapter IX. the organs of circulation are treated upon. Digitalis in his opinion is well borne by children. The nervous diseases are arranged classically in Chapter X. The author is not too prolific, yet covers the ground fully. It is worthy of note that the author does not believe much in electricity. He disapproves of craniotomy and craniectomy in idiocy. The lumbar puncture of Quinke and the frequent presence of the pneumococci in meningitis are also referred to. The author does not believe that marriage between relatives gives rise to constitutional or mental disease, providing hereditary diseases in an ascending line have not been present. In Chapter XI. twenty pages are devoted to therapy of skin-diseases; he also gives in two chapters a review of the principal eye and ear lesions. These are followed, in Chapter XIV., by the treatment of myositis and by a description of diseases of the muscles. In Chapter XV. the diseases of the bones and joints are considered, and here he discusses the operative treatment of congenital hip-joint luxation and the injections of iodoform. The use of guaiacol is well recommended. In the last chapter we find some valuable additions to pediatrics, which have been recently discovered and applied. Among these the treatment of diseases, like pernicious anæmia, carcinoma, sarcoma, infantile scurvy, myxomata, and diphtheria, with animal extracts, is discussed. He gives, furthermore, far-reaching statistics regarding the treatment of diphtheria with Behring's antitoxine, and closes the book with his views regarding the sterilization of cow's milk.

By reading Jacobi's work we gain many points of valuable information. The discoveries of recent years in modern therapeutics are critically reviewed, and incorporated with older measures and remedies that have proved satisfactory in his hands during an experience of many decades. As the book also combines symptomatology and etiology with the therapy of children, we have in the work a text-book of high standard.

G. E. R.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

JULY, 1896.

[No. 6.

ORIGINAL COMMUNICATIONS.

*A CASE OF LEPROSY OF THE MIXED TYPE.*¹

BY C. F. HERSMAN, M.D., AND H. N. LYON, M.D.

A SHORT time since there came to Dr. W. A. Hardaway's clinic, at the Missouri Medical College, a case of the mixed form of leprosy, which is of considerable interest. It is by permission of Dr. Hardaway that the following notes of this case are published:

John M., aged ten, is of French extraction, a native of this country, and has always had excellent health except for an eruption of "large blisters," which appeared for a short time upon his body when he was

¹ Dr. Charles Finley Hersman, one of the authors of the excellently reported case of leprosy that appears in this issue of the INTERNATIONAL MEDICAL MAGAZINE, died on October 11, 1895, at the early age of thirty-one years. He was born in Fulton, Mo., and was educated at Westminster College. After a short period of post-graduation study with a view to the ministry, he relinquished the idea and took up the study of medicine. In due season he graduated with the highest honors from the Missouri Medical College in St. Louis, and for several years subsequently devoted himself assiduously to hospital service and laboratory work. At the time of his death, when he had just assumed the responsibilities of private practice, there was no man of his age with better qualifications for the calling of a physician, uniting, as he did, scientific and practical ability, a charming personality, and a high sense of honor. Among his few contributions to medical literature, aside from certain articles in the medical press, may be mentioned the essay on "Lymphangioma" in Morrow's "System of Dermatology," and the joint authorship of the "Abstract on Dermatology and Syphilis" in Gould's "Year-Book of Medicine and Surgery." For some time also he made the reports on the "Progress of Skin-Diseases" in this magazine, besides making similar reports on "General Medicine" for a local journal. Some few weeks before his untimely death Dr. Hersman had been appointed professor of clinical medicine in his Alma Mater.

W. A. HARDAWAY, M.D.

five years old. The parents of the boy were healthy people, except that the father was an alcoholic. He has several brothers and sisters now living who are in good health and free from any form of skin-disease.

The boy has lived in various parts of Southern Texas, mostly at Galveston. About one year ago he came to live in St. Louis.

The child has always been regarded as a robust person, and even now he seems well nourished and the functions of the body, except as mentioned, are carried on in a perfectly normal way. His mind is mature beyond his years and is keen and active. His mental state is peculiar. He is easily made to cry, as by a reference to his illness, but the next instant is laughing at some childish jest.

In January of this year he frequently complained of pains in the feet and toes which were regarded by his relatives as "growing pains." During the same month he was ill from a "severe cold." While a convalescent his sister noticed a number of small "red pimples" over the small of the back. These disappeared in a short time, to be replaced by the "blotches" which now exist there. About the same time it was observed that he could not use the fingers of his right hand well, finding it difficult to hold a pen in writing. He never complained of any febrile symptoms.

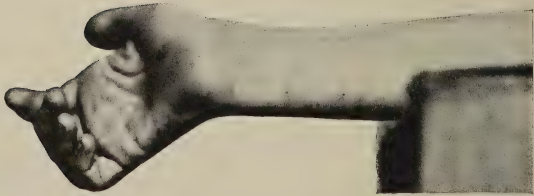
When first examined, August 8, 1895, the following condition was noted: On the forehead and extending on to the nose is a discolored area, of a violascent hue, an inch wide at its greatest diameter. The patch is slightly elevated, and on picking up the skin it is found to be thickened. Sensation in this area is only slightly affected, the points of the æsthesiometer being felt as one at two centimetres. Over the left eye and extending into the eyebrow is a similar area, about the size of a silver quarter, in which sensation is slightly diminished. On the left half of the upper lip is a spot which encroaches on the vermilion border and presents the same peculiarities as those just described. Continuing the inspection one finds an irregularly oval patch, two inches by three inches, just beneath and somewhat to the right of the umbilicus. This area is of a brownish or mahogany color, its borders slightly elevated, while the centre is depressed; it is lighter in color and appears atrophic. A small amount of infiltration can be appreciated at the border and there is slight scaling. The boy calls one point over this patch when the limbs of the æsthesiometer are separated three centimetres. The pain and temperature sensations are but little if any affected here. Beneath this patch, in the left pubic region, is an exactly similar area shaped like the figure 8, three inches long and one inch wide. On the dorsal surface of the penis, near the root, is a sinuous brownish ridge a quarter of an inch wide and slightly elevated. On the right side of the scrotum is an infiltrated patch of skin as large as a silver quarter, and of a pale fawn color. This area is elevated fully one-eighth of an inch, and the skin has lost its normal markings on account of the infiltration. Pain and tactile sense are diminished in this tubercle. The left epididymis is thicker than the right, but is not tender on pressure.

FIG. 1.



Posterior region of leprosy of the mixed type.

FIG. 2.



The so-called "leper claw."

The anterior surfaces of both thighs present a mottled discoloration limited above by the inguinal fold and below by the knee. This whole area is mapped out by a brown elevated border from a quarter of an inch to an inch in width, which passes above across the buttocks and below to the back of the knee, so that viewed from the rear the area has somewhat the shape of a pair of bathing trunks. The mottled areas thus enclosed are evidently due to the coalescence of isolated patches and the extension of their borders. At the middle part of the outer aspect of the left thigh is an islet of normal skin, near the centre of which are three semilunar infiltrations exactly resembling the borders of the large areas. Sensation on the anterior surfaces of the thighs is profoundly affected. The æsthesiometer is perceived as one point at eight centimetres. Analgesia is so marked that a pin can be thrust through a fold of skin without causing pain. There is a perversion of the temperature sense, heat being considered as cold, and cold objects being called hot. Sometimes the boy regarded a test-tube containing hot water as the prick of a pin.

Over the left scapula (Fig. 1) are two brown areas, the upper the size of a dollar and the lower twice as large. The two patches are beginning to coalesce at one point. In the lower area the centre has already become much lighter than the border. The back, from the waist-line to the knees, presents lesions varying in size from an inch up to several inches in diameter. The smaller patches show a uniform brown infiltration, but in all the large lesions the centres are atrophic. In some of the patches it could be clearly shown that while sensation was diminished at the centre, at the border hyperæsthesia existed. At some places the borders of the older lesions presented points of dense infiltration which could be properly termed tubercles.

The right forearm (Fig. 2) is involved by a white, somewhat atrophic area surrounded by a brown sinuous elevated border, such as has been described, though it is fainter than in the lesions upon the trunk. The right hand is in the position which has been styled "the leper claw," the fingers being flexed at the first phalanges and bent backward at the metacarpophalangeal joints. The thenar and hypothenar eminences are atrophied as well as the dorsal interossei. The strength of this hand is much less than that of the left. The outer side of the left forearm presents skin lesions similar to those described as affecting the right. At the bend of the elbow two diamond-shaped patches are to be seen. At the insertion of the left deltoid is a round brown infiltration. This looks exactly like a vaccine scar which had become the seat of the leprous infiltration, but the patient states that he has not been vaccinated. The muscles of the palmar surface of the left hand are slightly atrophied.

The right ulnar nerve is as large as an ordinary lead-pencil, and feels like a wire under the skin. Passing the finger up and down along the course of the nerve an indistinct sensation of nodules is experienced. The thickened nerve can be traced up into the axilla and downward to the ulnar

groove behind the elbow. The nerve does not seem tender to pressure, but at times, when forcible compression by rolling the nerve under the finger is made, a tingling is felt in the little finger. Sensation is markedly diminished in both sides of the little finger, in the ulnar side of the ring-finger, and to a less extent on the radial side of the ring-finger.

The left ulnar nerve is appreciably enlarged, but not so much as the right. About one and a half inches above the internal condyle a nodule can be felt which seems to be an enlarged lymphatic. It lies in the course of the nerve. If there is any alteration in sensation in the left hand in the distribution of the ulnar nerve, it is so slight that we could not be certain of it. The reflexes are normal, and sensation in the uvula, tonsils, and pharynx is not affected.

Upon the inner aspect of the right heel is a reddish, scaling area the size of a quarter, where the patient states that a blister arose without provocation about five weeks ago. Over the knuckles of the index, middle, and third fingers similar traces of blisters are to be seen. Both peroneal nerves seem somewhat thicker than normal. Upon the ball of the right foot is a fissure extending through to the true skin, which is very slow about healing. Patient does not know how he hurt himself to cause this. On several occasions he has run nails and pins into his feet without being aware of it.

Although febrile symptoms, according to the statement of the patient and his friends, have formed no part of his complaint, he has had a certain degree of fever on each occasion when we have taken his temperature, 100° F. being the highest. His pulse is in the afternoon about 100.

Though the most marked alterations of sensation were found on the anterior aspects of the thighs, yet in all the lesions they were more or less present. In some of the very small patches, where as yet there was no atrophic change, there was a slight hyperæsthesia, but in all the areas where atrophy had commenced touch, pain, and temperature sensation were all decreased.

We did not detect any special areas of anæsthesia or analgesia on the feet, but it was evident that the boy did not feel pain there in a normal way, since he admitted that he often wounded his feet without knowing it.

We made no accurate tests to determine the amount of perspiration from the affected areas, but owing to the dry and scaly look of the skin we believe that cutaneous transpiration was decreased.

PATHOLOGICAL ANATOMY.

A piece of skin was cut from the border of one of the older lesions. Sections cut from this show that the greatest changes have occurred in the corium. These changes consist of isolated accumulations of granulation tissue, of small exudation cells, collected for the most part about the blood-vessels, glands, and follicles. The corium is not thickly beset with these islands of granulation tissue, but everywhere normal tissue intervenes.

The stratum corneum is somewhat thickened. The rete seemed well-nigh obliterated. Here and there down growths from the epidermis into the corium could be seen.

The sebaceous glands were thickly hemmed in by exudation cells, and the epithelium of the acini was enlarged, in some places almost obliterating the lumen. The external and middle coats of the blood-vessels were infiltrated with masses of exudation cells, so that here and there a bulging of the walls and a partial obliteration of the lumen occurred.

In a few sections, a very few large multinuclear cells (resembling giant-cells) were met with, while none of the large mononuclear cells spoken of as "lepra cells" were found.

The sweat-glands could not be found in any of the sections examined.

It would seem from these findings that the essential factor of the process is an infiltration of granulation tissue, less vascular than syphilitic tissue and not showing such a tendency to the formation of nests as is seen in lupus. The changes probably commenced in the deeper layers of the corium, as here the most marked alterations are to be seen. These changes are specially to be noted about the blood-vessels, glands, and follicles.

Sections were also stained to show the lepra bacilli. Carbol-fuchsin solution was used. The sections were warmed in this solution for five minutes and then decolorized with twenty-per-cent. nitric acid. The most perfect results were obtained after a very long decolorization. The authors think that this fact cannot be too much insisted upon in examining for lepra bacilli. Several times we have failed to be able to demonstrate the bacilli because the granulation tissue in which they lie has not been sufficiently bleached, and so the outlines of the bacilli could not be made out. In this case the best slides were obtained after forty-eight hours' decolorization. The bacilli were found, for the most part, in the deepest part of the corium, lying in the characteristic heaps. None were discovered in cells, but they seemed to lie in the spaces between the connective-tissue bundles. In several places bacilli were discovered in the granulation masses about the hair-follicles. It seems to us that this case to a certain extent bears out Petrini's opinion¹ that the anomalies of sensation found in the lesions of the skin in anæsthetic leprosy are not due alone to the presence of the bacilli in the nerves, but to their localization in the skin. The skin lesion from which the piece of skin was cut for examination was such a one as is generally described as constituting a part of anæsthetic leprosy, and here our careful examination detected the bacilli typically located in the skin.

REMARKS.

In the title of this article we have referred to our case as one of leprosy of the mixed type. Nearly all the skin lesions are those which would fall under the description of anæsthetic leprosy except the well-defined nodule

¹ *Annales de Derm. et de Syph.*, December, 1894.

on the scrotum and perhaps also one or two points in the borders where, as mentioned, there were nodules.

It is always important in a leper to obtain a history of exposure to infection. Though in the case here reported we have made every effort to obtain information which would throw light on this point, we have been unsuccessful. However, when one remembers that Galveston, where the boy has long resided, is one of the southern ports having direct communication with certain leprous districts, such as Central America and Louisiana, it may be readily conceived that numerous unrecognized opportunities for infection have occurred.

Interest also attaches to the length of time during which the patient has been suffering from his malady. The closest questioning for some time failed to get any history dating further back than seven months, and yet, considering the ravages which the disease has made, this time seemed very short. Finally, the sister of the boy recalled that five years ago he suffered from a pemphigoid eruption. It is possible that this was really a leprous pemphigus.

The bullous lesion is the one which commonly first ushers in anæsthetic leprosy. If this be true it is odd that in the interval before the present attack there were no nervous symptoms. This may perhaps be accounted for by the age of the patient, which might not only render him oblivious to certain mild nervous disturbances, but might prevent his giving expression to what he felt.

It is unusual to see leprosy developing in this country in one so young. The disease is most often acquired by those who have resided in foreign countries, and such persons are usually adults.

In addition to those nervous disturbances which have been noted, in several patches there was demonstrated a retardation of nervous conduction such as may frequently be seen in locomotor ataxia.

It has often been stated by authors that it is probable that the pemphigoid lesions so frequently seen in lepers are the results of unconscious burns. A phenomenon was witnessed in our case which seems to show that there is a tendency on the part of the skin to respond to slight injuries of all sorts by the formation of blebs. Upon the first examination a pin was thrust into the skin at the centre of an atrophic lesion. On the next day a large bulla fully an inch in diameter was noticed in this place. The pin had not been thrust straight in, but had been passed horizontally into a fold of skin. The bleb was oval, with its axis along the track of the pin-wound. On another occasion the lad knelt for some time upon the rough edge of a chair. A few hours after he presented on each knee a small denuded area around the edges of which epithelial shreds like the tops of blebs could be seen.

It has frequently been noted that leprosy developing before the age of puberty interferes with sexual development. We thought in this case we could discover a leprous nodule in the epididymis. The disastrous effects

of leprosy upon the sexual functions may perhaps be due to lesions of the several organs as well as to lesions of the nervous system.

From a humanitarian point of view this case presents something of interest to which it may not be out of place to call attention. It is certain that lepers should not be permitted to mingle with their fellows, as there can be no doubt that the disease is capable of communication. Leprosy now plays an insignificant part among the infectious maladies of this country, and this fact affords the best argument for an efficient quarantine. If the disease should ever become as prevalent as tuberculosis is, it would be rather too late for quarantine to be effective. It needlessly complicates expenses for each State to sustain its own leper colony. And, besides, one should not forget that the unfortunate leper is still a human being with all the social tastes of our race. To segregate such persons where there are only a few or even only one leper is to inflict a needless hardship. The boy who forms the subject of these notes is a child with an unusually bright and active mind, with perhaps many years to live, and it is not a pleasant thought that he must be placed in complete isolation without mental or physical occupation. The government should maintain a leper colony where the interests of the community shall be fully protected while the unfortunate lepers are allowed as many means of happiness as their state admits.

*THE TREATMENT OF CARCINOMA OF THE UTERUS,
CERTAIN FORMS OF OVARIAN DISEASE, AND FI-
BROIDS OF THE UTERUS, BY MEANS OF THYROID,
PAROTID, AND MAMMARY GLAND THERAPEUTICS.¹*

BY ROBERT BELL, M.D., F.F.P.S.G.,

Senior Physician to the Glasgow Hospital for Diseases Peculiar to Women.

FROM the fact that disease is incompatible with health, it naturally follows that where disease has taken possession of a structure, there must have previously existed an enfeebled condition of the parts affected, or possibly a weakness or faulty action of a distant organ upon which that immediately affected is dependent for its healthy activity, either due to some reflex or other action which is not quite understood. If a person is in possession of perfect health, and all his functions are acting in accordance with this condition, then the resisting power of that individual against disease is at its acme; but if some depressing influence is brought to bear upon him as a whole, or upon a particular organ or organs in particular,

¹ Read before the British Gynæcological Society, May 14, 1896.

these, as a natural consequence, are rendered liable to become a prey to disease. For example, a person may one day be in the possession of the most robust health, and on the following—by exposure to the depressing effects resulting from prolonged exposure to cold—be completely placed *hors de combat*. This exposure doubtless depresses the vitality of the heretofore robust and healthy individual, when he is rendered liable to become the subject of disease, varying in type. Then, again, the health may be depressed by a continuous inhalation of poisonous gases, which produces a similar effect. Hence, on the one hand, the system may become prone to pneumonia, bronchitis, or various other inflammatory conditions; while, on the other, we find the body is converted into a nidus for the development of the virus of zymotic disease. Now, it cannot possibly be averred that the presence of the germs did not exist in the economy prior to the vitality having been reduced by the influences mentioned, and the only conclusion we can come to in the circumstances is that the inherent vigor of the healthy man was sufficient to withstand the onslaught of these germs whilst his health remained intact; whereas, in the other case, when this had been reduced by the one cause or the other, the vitality of the germs having attained a potency—the more powerful of the two—were thereby enabled to effect a successful invasion. From what we know of the history of these disease-producing entities, we are forced to the conclusion that they are ever present both without and within our bodies, and are only waiting their opportunity to enable them to assert their power for evil, and take action when the occasion arrives.

It is not, however, my intention to go into the pathogeny of specific disease, but to confine myself to the relationship of certain organs which exert a potent and incomprehensible influence upon distant structures. It is quite evident that when local disease commences in an individual, the organ which it takes possession of must have departed from the healthy standard prior to this. Moreover, it is not unreasonable to infer that the weakened condition of the organ affected may have been influenced by a morbid or functionally altered state of an organ in close physiological relationship. That is to say, the functions of the one part of the body are so dependent for their healthy condition upon the influence exerted on them by other organs that when the latter cease to exert their normal activity, the evil consequences upon the constitution at large are not always apparent in the structures themselves, but are manifested in a pathological condition of other parts. For example, we have learned from recent experience that the healthy condition of the skin, mucous membrane, and connective tissue subjacent to these is dependent to a very considerable extent upon a peculiar action of the thyroid gland. Hence, we have myxœdema occurring where this gland is incapacitated from performing its normal functions. Now, basing my reasoning on this and other similar coincidences, for a considerable time I have been devoting my attention to certain diseases of the female pelvis, and judging from the beneficial effects which thyroid extract exerts upon

the epithelium of the skin when psoriasis—even of an aggravated type—is present, I was led to infer that it might possibly be due to the absence of some obscure catalytic influence of this gland that epithelioma was enabled to take possession of the mucous membrane of the cervix uteri, seeing that the disease invariably commences in the epithelial layer of the mucous membrane. From this fact, and inferring that the thyroid gland would seem to exert a special influence upon the healthy functional activity of the epithelium, both of the skin and mucous membrane, I was naturally led to conclude that, as it acted so beneficially in psoriasis, it might be equally useful in the treatment of an unhealthy condition of mucous surfaces. While basing my argument on these lines, it must be conceded that an unhealthy condition of the thyroid does not necessarily or invariably give rise to epithelioma; yet in my experience it is frequently, nay, almost invariably, accompanied by an excessive metrorrhagia, showing that the function of this gland exerts some potent influence upon the lining membrane of the uterine canal as well as that of the cervix. Now, it is not at all a common occurrence for epithelioma to attack the cervix uteri if this portion of the organ has been immediately prior to the invasion, and is otherwise, in a normal condition. If, on the other hand, it is suffering from the effects of any lesion, such as laceration or hypertrophy due to long-continued endometritis, then it would seem that this unhealthy state of the part acts as a strong predisposing cause, not only to epithelioma, but to affections of a less virulent type. It seems also conclusive, from the experiments which I have made, that an exciting cause exists in an abnormal condition of the thyroid. Our duty, therefore, in every case where the uterus shows evidence of disease, however benign this may appear to be, is to endeavor to restore it to its normal condition, and thus remove what may be justly considered the predisposing cause to malignancy.

The notes of cases which I subjoin will go a long way to prove the correctness of this theory.

Then it would appear that the parotid gland exerts a most powerful influence upon the ovaries. Whether disease of the ovaries is superinduced by any lack of influence of the parotid, I am not in a position to judge, but this I can vouch for, that when disease does exist in the ovaries, this can be brought under subjection by the administration of parotid glands of healthy young sheep, calves, and pigs.

Then, again, it is also beyond dispute that fibroids of the uterus, as well as hyperplasia and flaccidity of the organ, can be most beneficially affected and brought under subjection by the employment of mammary glands of healthy animals. I have also ascertained that disease of the ovaries is beneficially influenced by the administration of mammary gland.

There seems, therefore, to be a considerable field for observation in the treatment of these diseases by means of glands which bear a physiological relationship to those which are diseased, and I now proceed to give a record of cases which I have treated by these therapeutic agents.

Besides the following cases of carcinoma of the cervix uteri which I have treated by means of thyroid elixir and palatinoids, a number which I have attended at the out-door department of the hospital have passed from under my observation, as they failed to report themselves when their symptoms were alleviated. I am, therefore, unable to give a complete report of these, and will confine myself to those private cases which I have kept under constant observation.

The first patient that I gave thyroid elixir to was Mrs. M., aged forty-eight, who came to me in the summer of 1895 complaining of constantly recurring floodings, alternating with a copious purulent and offensive discharge. On making a vaginal examination a cauliflower excrescence was brought into view. This I removed by curetting, and applied fuming nitric acid to the raw surface. She began by taking a teaspoonful of a carefully prepared thyroid elixir three times a day, and this she continued for three months. By this time all discharge had ceased, and her general health was much improved. I saw her on February 18 of this year, when, with the exception of a small slough that had come away, accompanied by the discharge of a little blood, she told me that she had had no evidence of disease. As the uterus was somewhat enlarged, and the stomach was evidently being upset by the long-continued use of the thyroid elixir, I put her upon the elixir of mammary gland, which she continued with the same frequency and dosage for some time. I saw her again on April 21, when she informed me that a considerable slough had come away, but this was unaccompanied by any discharge whatever; and although she was complaining considerably of weakness, she had no symptoms of local disease, and her intention was to go to the country for change of air.

Mrs. G., aged sixty-five, was sent to me by Dr. Donald, of Paisley, on December 10, 1895. She was suffering at the time from a copious discharge of fetid pus, but she had been seriously exhausted by repeated attacks of severe hemorrhage, and was quite cachectic. Epithelioma had made considerable inroad upon the cervical tissue and extended considerably beyond the cervix. As much of the diseased tissue as could be safely acted upon by the curette was removed, and a stick of chloride of zinc inserted within the canal. She was ordered to take a teaspoonful of thyroid elixir three times a day, and was sent home at the end of a week. Within a few days of her return she was seized by a severe flooding, which Dr. Donald had considerable difficulty in checking. Since then, however, she has had no more return of discharge of any kind, and at the present time there is no trace of disease remaining.

The following notes have been sent me within the last few days by Dr. Donald:

"Mrs. G., aged sixty-five, enjoyed remarkably good health all her days; in fact, until the recent illness had never been a single day in bed, except during confinements. She first menstruated when she was fifteen

years of age, and was always regular. She was married at the age of twenty-five, and has had ten natural confinements, all her children being alive. Her last child was born when she was forty-nine years of age, when she made an excellent recovery. This labor was as natural as any. The patient never again menstruated. The first evidence of her recent illness beginning was four and a half years ago, when she complained of a hot, burning feeling in her external genitals and vagina, and great pain on micturition. These symptoms gradually got worse, but became greatly aggravated by severe backache, so much so that she could only walk with difficulty. About eighteen months ago the slight discharge which she had with the foregoing symptoms became increased, more purulent in character, and at times bloody. I saw Mrs. G. early this year, and since that time had frequent opportunities to observe her various symptoms. The discharge being very free, she had lost considerably in weight and strength. Since she was under treatment by Dr. Bell the discharge has entirely ceased; she is free from all pain and discomfort; has gained in weight, and consequently strength. In fact, she says she feels now perfectly well.

(Signed)

“ARCH. DONALD.”

Mrs. M., aged thirty-one, suffering from carcinoma of the cervix, has been taking thyroid elixir for over two months, and had ichthyol tampons applied twice a week during the whole of this period. All symptoms of malignancy have now disappeared, and the health of the patient is better than it has been for years. She is still taking the thyroid elixir, and continuing the use of the tampons.

Dr. MacGregor reports on this case on April 17 and states: “The cervix appears healthy with the exception that there is a very slight trace of erosion on the under lip, also a little mucous discharge, but very small in quantity.”

Miss D., aged forty-eight, from Darlington, called upon me on November 28, 1895. She was suffering from a large fibroid of the uterus, and her object in coming to me was to have this removed. As I was interesting myself in the gland-treatment of the uterus and ovaries, I prevailed upon her to remain under my observation for two months, and to take elixir of mammary gland in teaspoonful doses three times a day, instead of submitting to operative treatment. This she consented to do. She called on me on February 4, when the tumor, which before had been quite globular in shape, and would compare to a pregnancy of about seven months, was very much reduced in size, and had become quite irregular in outline. I again saw her on February 18, when she expressed herself as feeling still much better, and there was further evidence of reduction in the size of the tumor. She had now no inconvenience from its presence, and returned home. In the latter end of March I had a letter from her from Stockton, stating that she is still improving. On April 21 she came to report herself, when I found the tumor was not more than one-fourth of its original size, and it

had ceased to give any trouble; in fact, she stated that she was not aware of its presence. She is to continue the mammary palatinoids twice a day.

Mrs. L., aged thirty-three, has a small fibroid on the anterior wall. (These notes are dated January 21, 1895.) She was ordered to take mammary palatinoids, each containing five grains, three times a day. I saw her on April 2 and found the tumor had diminished considerably in size, and the hemorrhage had ceased. Her anæmic condition had also disappeared, and her general health was restored. On May 5 she called to report herself after her menstruation, and stated that although it was still in excess of what it was wont to be before she took ill, yet it had not given her any concern.

Mrs. McC., from Perth, consulted me on March 18, 1896. She was the subject of menorrhagia, dysmenorrhœa, and a highly sensitive condition of the uterus. I made an application of iodized phenol to the uterine canal, and ordered her to take three palatinoids of mammary gland *per diem*. On April 3 she returned and stated that all her pain had disappeared, and that the general health was very much improved. She called again after her next menstruation, and stated that the discharge was considerably less in quantity, and had not been accompanied by pain.

Mrs. T., aged thirty-four, from Grahamston, married eleven years, two children, the last four years old, consulted me on March 6. She was suffering from menorrhagia and enlargement of the uterus. Since then she has come into Glasgow once a week, and I have applied iodized phenol to the uterine canal and introduced an ichthyol tampon. At the same time she has been taking three mammary palatinoids *per diem*. She menstruated during the last week of March, when the quantity of discharge was considerably reduced. On April 7 her general health was very much improved, and the condition of the uterus was highly satisfactory. When I saw her, on May 5, she stated that her painful symptoms had entirely disappeared, and expressed herself as feeling perfectly well.

Mrs. O., aged thirty, no family, consulted me on January 28, complaining of a hard lump in the right pelvis which caused her considerable pain, and she was anxious for me to remove it. This I diagnosed to be an enlarged ovary, probably fibroid in its nature. I agreed to the operation on condition that her husband and other friends gave their consent. On her husband coming to see me, he begged that I in the first place would consent to give a fair trial to medicinal measures before resorting to operation. This I readily agreed to, as I was most anxious to try the effects of parotid gland in such a case. I therefore prescribed three five-grain parotid palatinoids *per diem*, and she has called upon me once a week, so that I could watch the case carefully, when I took the opportunity of introducing an ichthyol tampon. On February 21 her health was much improved, while the tumor was more movable, not so painful to touch, and decidedly smaller in size. She then commenced to take four palatinoids in the twenty-four hours. I again saw her on March 10, when she had just menstruated and

had suffered no pain. The ovary did not seem to be further reduced, but was evidently less sensitive to touch. She is still under treatment, and her condition continues to improve.

Mrs. H., aged fifty, consulted me in December, 1895, suffering from an enlarged left ovary, which had attained the size of a mandarin orange. There was also a suspicious condition of the cervix. I applied an ichthyol tampon, and prescribed parotid palatinoids, to be taken four times a day. On March 10 all suffering had disappeared, and the ovary had returned to almost its normal condition. She has been continuing the palatinoids since, and on May 5, when I saw her last, there was no sign of disease whatever.

Mrs. M., aged thirty-five, from Greenock, consulted me on February 25. She was then suffering from enlarged right ovary, and had metrorrhagia, which continued for about three weeks. She was also very dyspeptic, for which I prescribed, and also advised her to take parotid palatinoids four times a day. These she has continued with the most satisfactory results, the right ovary having attained its normal condition, and the menorrhagia has ceased.

Mrs. M., aged thirty-six, first consulted me in May, 1888, when the uterus was large, flabby, and patulous. This was curetted on two different occasions. The right ovary and tube were also enlarged and excessively painful. During the past two years she has had ichthyol tampons applied biweekly with little intermission. During the summer and autumn of last year she took ichthyol tabloids regularly for four months, with the result that the tube returned to its normal condition, but the ovary still remained very much enlarged and acutely sensitive to touch. On February 14 she commenced to take parotid palatinoids three times a day. On March 3 following she called to report herself, when I found the ovary distinctly smaller and less tender, but she had had menorrhagia for twelve days. On April 2 I saw her again, when the ovary was still further improved in every respect, and she expressed herself as feeling better in health than she has done for over eight years.

The following notes of cases have been handed me by Dr. MacGregor :

"Maggie H., aged nineteen, consulted me on March 9, 1896. She complained of great pain at the beginning of and during the menstrual flow, also pain over the right ovary, with a feeling of weight in the abdomen. She has suffered more or less for the last two years. Regular twenty-eight days' type, the flow, however, lasting for seven days. She had leucorrhœa, colored discharges, and suffered from lowness of spirits. P. V. examination gives the following: Tubes on both sides enlarged, swollen, and extremely tender to pressure. The ovary on the right side swollen and very painful to the touch. She has had ichthyol tampons applied twice a week, and has been taking parotid palatinoids thrice daily. When I saw her, on April 29, the patient said she had had no pain at her menstrual period, and the swelling of the right ovary and tube were much diminished, while the tenderness

to touch was almost gone. The patient stated that she felt ever so much better."

Mrs. R. Fife, aged twenty-nine, consulted me on April 11, complaining of constant backache, leucorrhœa, pain over both iliac regions, the pain shooting down her limbs, frequent desire to pass water, and the bowels constipated. The patient looked thin, careworn, and had an anxious expression. She stated that she had not felt well for eight years. She has had three children and one miscarriage. Her last confinement was two and a half years ago, when the labor was tedious. She has been married for ten years. She suffered from dyspepsia, slept badly, and was much depressed in spirits. Physical examination disclosed torn perineum, lacerated cervix on left side, chronic endometritis, subinvolution, retroflexion, and tubes and ovaries swollen and tender on left side. Treatment was commenced at once, iodized phenol being applied to the interior of the uterus, which was replaced and a glycerin tampon inserted. She was put on parotid palatinoids, and at the end of two weeks the glycerin tampons were changed for ichthyol ones. When I saw the patient on May 9 her condition locally had undergone a marked change. The tubes and ovaries were no longer tender, their congestion had markedly diminished, while the leucorrhœa had almost entirely disappeared. The patient expressed herself as feeling ever so much better, which she looks, for she has put on flesh and looks bright and cheerful.

I have detailed these few cases, which *are not* selected, and are given as examples of the therapeutic effects of the gland-treatment of the different diseases enumerated. When we come to consider the close physiological relationship of one structure with another, and the peculiar effects of marriage on the one hand and virginity on the other, the latter rendering certain organs much more prone to disease than would have been the case had these been brought into functional activity, we are naturally led to conclude that something may be done to combat the tendency to pathological change which would appear to take place in these circumstances, so that an immense field for observation seems to be opening out and will surely repay any amount of time expended upon elucidating these recondite physiological and pathological problems.

*A PLEA FOR MODERATION IN OUR STATEMENTS REGARDING THE CONTAGIOUSNESS OF PULMONARY CONSUMPTION.*¹

BY VINCENT Y. BOWDITCH, M.D.,

Assistant in Clinical Medicine at the Harvard Medical School; Assistant Visiting Physician at the Boston City Hospital.

GENTLEMEN OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION,—Recent events in Boston have impelled me to say a few words to you at our annual meeting with the hope that by discussion of the subject we may have some influence directly or indirectly upon the community, especially the laity, in checking what has of late frequently seemed unnecessary alarm about the contagiousness of tubercular disease, especially in its pulmonary form.

In what I am about to say I trust that I shall neither seem to disparage the great advance in medical knowledge due to bacteriology, nor to discourage in any way all reasonable efforts to prevent the spread of tuberculosis. I firmly believe that in another generation we shall see a diminution in the general death-rate from this disease, largely due to the precautions which are so earnestly advocated by the mass of the profession. I only wish to protest against the unreasonable and often, as I deem it, cruel attitude taken by the laity and even by physicians in their desire to prevent the spread of the disease.

Not many weeks ago the people in Boston were treated in their local papers to hot discussions, which have been carried on at the City Hall, relative to the proposed enlargement of a certain institution in the suburbs for the shelter of poor consumptives.

I have been surprised and even shocked to read the statements of some medical men at these hearings, to say nothing of the extravagant words of members of the laity, mostly composed of people living near the institution, who in their desire to rid themselves of what seemed to them an objectionable neighbor, have given vent to most unwarrantable statements which serve to give the public unnecessary alarm, and create that state of constant apprehension which I believe is a potent factor in the production of disease.

The only excuse that I can conceive of for the marked opposition to this special institution is that at one time it was not conducted as a well-regulated hospital for consumptives should be, and that before we knew

¹ Presented at the annual meeting of the American Climatological Association at Lakewood, N. J., May 13, 1896. Printed also in the *Boston Medical and Surgical Journal* of June 25, 1896.

the importance of destroying the chief source of infection—viz., the sputa—patients were allowed to expectorate upon the grounds about the building, a method which I have lately been told by one of the trustees has been absolutely prohibited on pain of dismissal at the first offence.

Not long after these statements had appeared in the papers I was asked by a layman my opinion upon the subject of the contagiousness of consumption. I told him that doubtless it was a contagious disease under certain conditions, but that with certain precautions, chiefly in the strict care of the sputa, the dangers from contagion were reduced to a minimum. It then came to light that he was one of the opponents of the institution about which such a controversy had occurred, and he almost angrily turned to me and said, "It is abominable that such hospitals should be allowed anywhere in our midst. They are a source of danger to all."

The gentleman seemed to be oblivious to the fact that these same consumptive patients confined in the walls or in the grounds of the institution were an infinitely less source of danger than if allowed to roam at large, spitting in the street-cars, public places, or even in their own homes. His position represents that of thousands who hold the same unreasonable views, and who in their fear of contagion forget the sympathy and kindness due to those who are suffering from consumption; and for these views the extravagant or careless statements, I regret to say, of our own profession are largely to blame.

When a physician asserts that consumption is "as contagious as small-pox," and that "hospitals for consumptives are a source of danger to the whole surrounding community," I consider him culpable for making perfectly unwarrantable statements that cannot be borne out by facts.

It has been proved by observation in the communities near two of the largest sanatoria for consumptives in the world—viz., Görbersdorf in Silesia, and Falkenstein near Frankfort—that consumption has lessened in amount among the entire population since the introduction of the sanatoria there, largely due, it can justly be said, to the strict hygienic rules which are used at the sanatoria for the disposition of sputa, and which are taught to the inhabitants in the surrounding villages.¹

It is doubtless perfectly true, on the other hand, that in various "open resorts" for consumptives where strict methods for disinfection of the hotels and boarding-houses are not enforced, the death-rate among the natives from consumption has increased greatly, the most striking cases being those of Mentone and Nice, where, according to statistics, consumption has greatly increased since these places have become such common resorts for phthisical patients, many of whom through carelessness or ignorance become sources of contagion to others.²

¹ Römpler, "Beiträge zur Lehre von der chronischen Lungen Schwinduscht."

² (a) Bennett "On the Contagion of Phthisis Pulmonalis;" (b) S. A. Knopf, Letter from Dr. Balestre, quoted in "Les Sanatoria," *Traitement et Prophylaxie de la Phthisis pulmonaire*, p. 173.

Whether this increase of consumption among the natives is due to the lack of strict hygienic rules among the hotels and boarding-houses for phthisical patients in Nice and Mentone or because the native population have changed their former out-of-door occupations to the more confined life of hotel attendants may be justly questioned, and yet the difference between the experience at Mentone and at the two great sanatoria just mentioned is very striking.

In a very interesting paper entitled "A Study of the Infectiousness of the Dust in the Adirondack Cottage Sanitarium,"¹ Dr. Irwin W. Hance has given some results which prove how little danger there is of infection in properly regulated institutions.

Guinea-pigs were inoculated with the dust taken from various rooms of the sanitarium, and tuberculosis was found to be present only in the animals who had been inoculated with the dust from the room of a careless patient who had been complained of for spitting on the floor,—a striking example of the absolute necessity of cleanliness in this particular.

In the large hospital for consumptives at Brompton, London, where the same strict hygienic rules are maintained as at the great sanatoria of Germany, the percentage of hospital attendants who have developed phthisis is very small indeed, according to the statements of Dr. C. T. Williams.

Directly bearing upon the subject in question are the scientific and very important experiments of Delepine and Ransome with reference to the germicidal effect of various substances upon the bacilli of tuberculosis. In these experiments exposure to the full rays of the sun for a comparatively short time (a few hours) proved the most efficient germicide of all, it being sufficient to render the bacilli completely inert, the inoculated animals showing no signs of tuberculosis. The experiments were made, it is important to state, with dried sputa, and not with simple cultures of the bacillus.

They found, moreover, that the one-to-ten or one-to-a-hundred solution of chlorinated lime proved to be the most efficient agent for disinfecting the clothing and the walls and floors upon which the sputa had been expectorated.

Since the publication of Ransome's paper I have been rather surprised that no other bacteriologists have experimented in this special direction, or at least that I have been unable to find published accounts of such experiments. A. K. Stone and others have proved the extreme vitality of the bacilli when not exposed to the sun, sputa dried for three years in a dark place having produced tuberculosis in animals, but we need the results of more extensive experiments in the direction Ransome has taken, the importance of which in the practical every-day dealing with consumptive patients can hardly be over-estimated.

¹ New York Medical Record, December 28, 1895.

As a result of the experiments of Ransome, it is certainly a legitimate doubt to come to our minds as to how far we need fear infection from sputa which is expectorated onto the open ground exposed to the full rays of sunlight. Not that I would relax one iota in the restriction of the disgusting habit (to say the least) of spitting publicly anywhere; it is only a question as to its danger under the condition of exposure to the sun's rays.

Thus we have scientific facts to help us in trying to show the laity that the consumptive need not be treated like a leper or as one affected with the plague, but that moderate measures will prevent his being a source of danger to those about him.

It is doubtless natural that the ordinary hotel-keeper should prefer not to receive a guest far advanced in consumption for reasons other than fear of infection, but I have seen too much of the sadness arising from the fairly brutal disregard of the poor sufferer's feelings in some cases not to make me wish to beg for moderation in our statements to the laity, lest we be guilty not only of making assertions not based on scientific truth, but also of adding unnecessarily to the mental suffering of those who are already burdened with physical ills.

I can never forget the pathos of a former consumptive patient of mine now dead, as he told me of his experience once in an Adirondack hotel, the proprietor of which came to him and told him that he must leave, when feeling forlorn and ill, "because he had a cough," and this instance is but one of many, as almost any specialist for chest-diseases can testify.

In conclusion, let me emphasize my own position in this matter, lest by any chance I should be misunderstood as wishing to relax in methods for perfect cleanliness about the consumptive patient. I advocate most firmly the destruction of the sputa by fire or other methods of disinfection. I believe also that the rooms occupied by a consumptive patient should be thoroughly cleansed with chlorinated lime or carbolic acid,—in short, that all reasonable methods should be adopted to kill the germs of the disease, but I wish to refute the statements that *properly regulated* consumptive hospitals are sources of danger to the community, when I believe them to be exactly the opposite, as shown by statistics. I wish also to plead for the consumptive who in his exile is made to feel the forlornness of his condition still more keenly by the selfishness of those who, in their desire to escape the possibility of infection, shut their doors in his face, as it were, utterly regardless of the mental suffering they are inflicting.

Future experimentation will doubtless throw more light upon the subject, but meanwhile let us in our zeal as physicians be careful not to make statements which we may be obliged later to retract as not being founded upon scientific truths.

THE INFLUENCE OF CLIMATE ON GENITO-URINARY TUBERCULOSIS.¹

BY JOHN C. MUNRO, M.D.,

Boston.

IN the cities and large towns along the Atlantic seaboard tuberculosis of the kidneys, bladder, prostate, vesiculæ, epididymes, or tubes is far from rare; it is frequently overlooked, especially in the earlier stages, and often, when recognized, the disease has created so much havoc that nothing can be done beyond making the victim comfortable. The pathetic, relentless suffering in the later stages in such cases warrants the plea that physicians should endeavor to detect the invasion as early as possible, and that no rational treatment promising relief should be neglected.

For a long time it has been recognized that the class of patients under consideration is best treated by a careful out-door country life in conjunction with surgical interference when necessary or possible. If this is true, and there can be no doubt of the fact, cannot more be gained by sending such cases, at least in the incipient stages, to a climate where other forms of tuberculosis are benefited or cured?

In order to answer this question, a circular was sent to the members of this association requesting their views and experiences, and the writer takes this opportunity to express his gratitude for the many replies sent him, so full of kindly interest.

Of seventy-five responses about fifty are more or less replete with valuable data, but, as it is impossible to give credit to each shade of difference and interpretation, it has seemed best to condense the data and treat them as if they were the result of a single physician's large and varied experience. Reports of a number of interesting cases in support of one view or another have been sent, but it is not practicable to incorporate them in a brief summary.

The views of the majority on any one question are, perhaps, given undue prominence; the attempt, however, is made to give equal consideration to the opinions of the minority, no matter how small it may be.

Of the reply to the first question—"Are patients with tuberculosis of the kidney, bladder, epididymis, prostate, or vesiculæ benefited or injured by climatic treatment?"—there is scarcely any doubt. There is no reason why the situation of the disease should form an exception to the rule, especially if the general resistance and the nutrition are improved. The

¹ Read at the annual meeting of the American Climatological Association at Lakewood, N. J., May 12, 1896.

benefit is, of course, indirect for the most part, but it can be materially aided by proper local treatment, not necessarily operative in the majority of cases.

The rate of improvement is not so rapid as it is in pulmonary phthisis, and it may be that, for reasons unjustly ascribed to the climate, cases occur in which harm follows this method of treatment. But in the East, patients are much improved if not often cured by an out-door life, and it is not difficult to understand that the benefit might be increased by emigrating to that part of the country where the opportunities for, and the benefit from, an out-door life are naturally greater.

One or two correspondents write that they have never seen any good follow climatic treatment in the class of cases under consideration, but their experience differs so much from that of the other members that one is constrained to believe that they have, unfortunately, seen only the late forms of the disease, where any treatment is hardly more than palliative. It is to avoid sending this very class of cases that the good results from a healthy climate in the incipient stages should be emphasized. A few writers contend that joint tuberculoses do well without regard to climatic influences; but it must be borne in mind that the genito-urinary form is less localized, more easily disseminated, and cannot be placed in the same category as the former. Furthermore, there is good reason to believe that joint cases are better treated in a high dry climate.

"Do patients undergoing climatic treatment for pulmonary tuberculosis develop, commonly, a genito-urinary tuberculosis when the pulmonary lesions are disappearing?"—That is, do physicians in healthy climates see genito-urinary tuberculosis as frequently as we do in unhealthy (tuberculous) climates when patients exhibit practically no other manifestations of an active invasion of the tubercle bacilli? Apparently such a development is very rare. Four correspondents report having seen single cases only during many years of practice, while primary genito-urinary tuberculosis is comparatively unknown,—a condition far different from that which obtains in tuberculous regions.

"Does pulmonary tuberculosis tend to develop in patients undergoing climatic treatment for genito-urinary tuberculosis?" So few patients, proportionately, are sent for treatment of genito-urinary tuberculosis alone that a definite answer cannot be given, but there seems to be no noticeable tendency to invasion of the lungs in the early stages, and in all probability if such a tendency did exist, it would be retarded or prevented in a suitable climate.

In advanced cases, on the other hand, pulmonary invasion is as common in one climate as another, but how far such a complication may be retarded cannot be answered without further investigations. In general, most observers agree that there is very little interrelation between the disease in the lungs and in the uro-genital tract.

"After apparent cure from genito-urinary tuberculosis can patients

ever return to their homes?" Probably to a small extent in selected cases, when the cure has lasted for many months, where the home surroundings will be of the best, and provided the patient is persistently and carefully watched. The permanency of the cure, though less frequent, is apparently as well established as in pulmonary phthisis; it is not uncommon, however, to see instances of permanent arrest without permanent cure.

The return home should be regarded in the light of a dangerous experiment, and the change should invariably be advised by the physician in immediate charge.

Where the arrested lesions can be entirely removed by surgical interference, the chances of a safe return to the former home are much increased.

"Do patients with advanced genito-urinary tuberculosis,—*e.g.*, abscess of the kidney, testes, vesiculæ, etc., ever recover their general health?" Occasionally with the aid of surgery, advanced (abscess) cases do recover, but it is doubtful if the proportion is much greater in the healthy than in the unhealthy climate. After surgical interference in an unhealthy climate, the chances of a return or of an invasion elsewhere would be lessened by emigration to an anti-tuberculous part of the country.

"Must the same precautions, as regards exercise, diet, rest, etc., that are given to phthisical patients, be given to patients with genito-urinary tuberculosis when emigrating to high altitudes?" Practically the same precautions should be exercised in directing the daily life of such a patient as in the case of pulmonary tuberculosis, especial attention being given to the diet where there are renal or vesical lesions, and to proper exercise where the prostate or vesiculæ are involved.

Over-exercise will produce general systemic or cardiac disturbance in the same way that it does in phthisical patients, and the risk of general infection cannot be disregarded in the one form more than in the other.

These patients are less amenable to treatment than are those with pulmonary trouble, and this fact must be considered when directing their habits of life.

"Is there any one type of climate especially adapted to the treatment of genito-urinary tuberculosis?" There is no one climate or locality suitable for all cases, the general rule being that, where pulmonary cases do well, it is safe to send genito-urinary cases.

When, however, the disease is limited to the kidneys or bladder, a climate equable, warm, and not too dry should be selected; where out-door life is most possible, and where the drinking water is of the best. Such conditions do not exclude sea-shore resorts, like Atlantic City, Nassau, the Bermudas, Jacksonville, etc. In case the immediate coast is not desirable, proper conditions can be found in regions like San Antonio, Augusta, Thomasville, Aiken, Southern California, etc.

A high, cold, dry climate is unsuitable, particularly in renal cases, if a concomitant pulmonary lesion is the point of therapeutic attack, because the vigorous out-door treatment in zero weather puts too much strain on the

kidneys, and the latter organs are in a state of constant irritation, even though there is steady improvement in the chest. Even without an attendant focus in the lungs such a climate should be chosen with great caution, and with a full realization of the risk of overworking the kidneys during the colder months of the year.

Patients with the lesion limited to the epididymis or to the vesiculæ can generally be treated best in a high, dry climate like Colorado, provided, of course, there is no cardiac contraindication.

Prostatic and bladder types do well in either a low or a high altitude, care again being taken against exposure in the cold months. These cases are also benefited by treatment at the various baths, like the Hot Springs of Virginia, or Arkansas, or the Hudson Hot Springs. A hot, dry, desiccating climate that naturally induces the various hepatic and pelvic congestions is unsuitable: there the acute venereal diseases are stubborn to treatment, and for the same reason tuberculous lesions would do badly.

In conclusion, we may say that genito-urinary tuberculosis is benefited by climatic treatment.

That patients should be sent to healthy climates in the incipient stages more frequently than has been the custom heretofore.

That this form is less amenable to treatment than pulmonary phthisis in the latter stages, but that the results of surgical interference can be improved by climate.

That moderately dry, equable, mild climates are suitable to the majority of patients, the high, colder climates being reserved for selected cases.

That whatever climate is chosen, the benefits depend upon proper food, hygiene, exercise, and fresh air, as in pulmonary phthisis.

ARTERIO-SCLEROSIS AMONG THE INSANE.

BY E. D. BONDURANT, M.D.,

Assistant Superintendent of the Alabama Bryce Insane Hospital at Tuscaloosa.

THOSE forms of arterial disease and degeneracy embraced in the terms "arterial sclerosis," "chronic endarteritis," "atheroma, etc.," are thought to have their beginning in certain inflammatory changes, regarding the exact nature and etiology of which some confusion as well as diversity of opinion exists. The disease, whatever its nature and origin, while it may in some cases involve all the coats of the blood-vessel, has its usual and characteristic situation in the intima, and for its usual and characteristic effect, sclerosis and loss of resiliency in the arterial wall. The process may be a diffuse one, but it is most commonly distributed irregularly, the inner surface of the vessel exhibiting patches of sclerosis separated by areas of

comparatively healthy tissue, or is furrowed or wrinkled with irregularities. In many cases also there occurs a deposition of new material within the affected area of the vessel wall, this newly-formed tissue being in some cases hyaline and nearly structureless ("hyaline degeneration"); in others containing round cells, few or many, embedded in a hyaline or gelatinous matrix. This newly-formed tissue, furthermore, is very prone to early and extensive, slowly progressive, degenerative changes, fatty or, less frequently, calcareous in nature, which render the diseased areas more distinctly visible, giving rise to the familiar "atheromatous plaque." In later stages there is often breaking down and disintegration of the atheromatous patch with formation of shallow depressions, having ragged, irregularly contoured walls,—"atheromatous ulcers." A possible concomitant result of this disintegration is the formation of *emboli*, bits of the eroded wall being carried away by the blood-current to lodge in some smaller artery. Another effect of this degeneration and partial destruction is, necessarily, a localized weakening of the arterial wall favoring rupture with hemorrhage, or in certain cases resulting in the development of aneurism.

In those cases in which the degenerative change is calcareous in character, the formation of irregular chalky masses, or of smooth "calcareous plates," is a common result. In extreme cases these deposits may involve the entire circumference of the vessel for long distances, rendering the arterial wall so brittle that instead of bending it fractures under application of force. The fatty and calcareous degenerative changes are often combined; indeed, in the more serious cases this is the general rule, the deposition of calcareous matter appearing as a later stage of the fatty degenerative atheroma.

The patches of atheroma are raised, usually encroaching slightly upon the lumen of the artery, although in ordinary cases they interfere only in very minor degree with blood-flow. In some instances, however, the processes which result in formation of new tissue seem especially active, the affected areas bulge greatly, seriously obstruct the flow of blood, or even eventually obliterate the lumen of the vessel. This is the "endarteritis obliterans" of the text-books.

This chronic arterial disease begins usually in the aorta, and in some cases is confined entirely to the aorta and its larger branches, although in most cases in which any symptoms of arterial sclerosis are discoverable during life, the disease is found more widely distributed, in some instances affecting the larger venous walls as well as the smaller arteries throughout the body.

The frequency with which these degenerative arterial diseases are met with among insane people, as well as their correlation with certain more or less characteristic clinical symptoms, mental and physical, has already been commented upon more than once, and will become sufficiently evident to any who study the disease even from its clinical aspect alone; more especially to those who have the opportunity of observing cases during long

periods, and of following fatal cases to the autopsy table and confirming or correcting clinical diagnosis by post-mortem examination.

A hospital for the insane offers a peculiarly favorable field for the investigation of such forms of chronic disease as the one under consideration, since a large percentage of the patients remain under treatment for long periods. And where all cases are given a careful physical examination at time of admission, followed subsequently with reasonable care, and post-mortem examinations made in a large proportion of the fatal cases, an amount of material bearing upon the several aspects of the arterio-sclerotic question must necessarily accumulate. It is with a view of briefly recording some of the results of our observation of this disease among the insane at this hospital that this report is made.

While we have the records of several thousand cases of insanity in which one or more physical examinations have been made, including in every case examination of the heart and blood-vessels and analysis of the urine, chemical and microscopical, it is intended here to deal chiefly with those cases in which post-mortem examination has removed all doubt as to diagnosis.

At the two hundred consecutive autopsies here used as the basis of our study we find that the macroscopic examination included the condition of the heart; the aorta and its larger branches; the coronary arteries; the arteries of the base of the brain,—basilar, circle of Willis, and larger branches of the same,—and the large veins. In about one hundred and fifty of the cases subsequent microscopic study of the kidneys was made, and in a smaller number sections of the brain, of the liver, spleen, and other organs were made and examined with the purpose of discovering the condition of the smaller arterial and venous twigs.

To give even a brief outline of the pathological changes noted in all of these cases, or even a synopsis of the condition of the circulatory system alone, would extend this paper to a quite unreasonable length. The cases will therefore be summarized and studied collectively. An analysis of the two hundred cases results as follows:

Frequency of Arterial Sclerosis and Atheroma.—About thirty-five per cent. of our cases show either no macroscopic evidence of arterial disease or the abnormalities are confined to a very few pale, inconspicuous yellowish patches in the arch of the aorta: only about fifteen per cent. of the two hundred cases are *absolutely free* of the disease in some stage.

Sixty-five per cent. show distinct arterio-sclerosis, something more than one-half of these exhibiting atheromatous patches or sclerosis of the aorta, without extension of the disease to the smaller vessels; the other smaller half, about twenty-eight per cent. of the whole number examined, show the degenerative change in a high degree in the aorta, and the lesion is detected in the smaller arteries. The veins are rarely involved, and in no case to any marked degree.

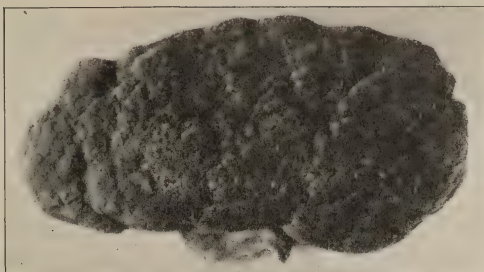
Our cases, then, fall into three groups nearly equal in numbers: one

FIG. 1.



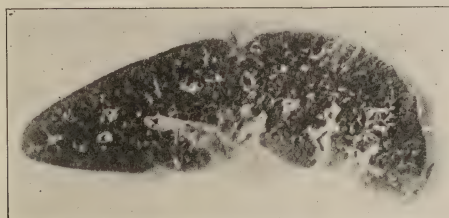
Inner surface of abdominal aorta, one-half natural size, in which there is sclerosis with atheroma and calca-reous degeneration. From a case of terminal dementia with general arte-rio-sclerosis.

FIG. 2.



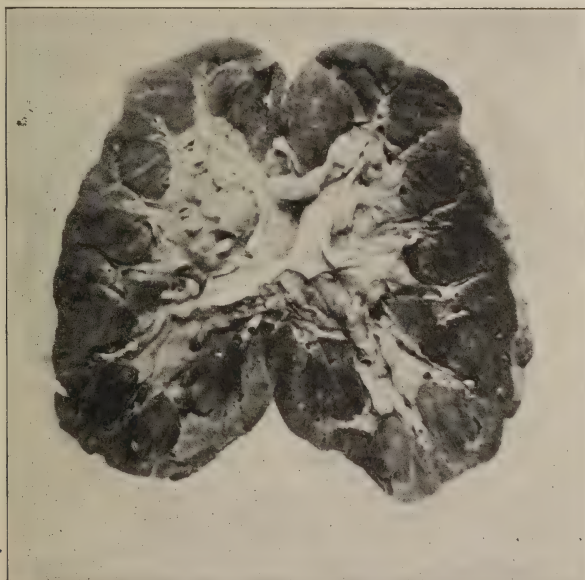
Arterio-sclerotic contracted kidney, showing charac-teristic red granular surface remaining after removal of the capsule. Four-fifths natural size. From same case as Fig. 1.

FIG. 4.



Cut surface of contracted spleen, from same case as Fig. 1. Four-fifths natural size.

FIG. 3.



Cut surface of the kidney shown in Fig. 2.

showing practically no arterial disease; one, slight involvement of the larger arteries; the third exhibiting well-marked and widely diffused degenerative and sclerotic change throughout a considerable portion of the arterial system. Of course, these groups shade almost imperceptibly into one another, the lesions in group three being obviously a later stage of the milder disease shown in group two, and this second or transition group passing by imperceptible gradations into those cases included in group one, where the disease is shown in pale, scarcely visible patches in the aorta, or in which examination is entirely negative.

Race.—Of the whole number, one hundred and thirty-one of the cases were white, sixty-nine colored. The percentage of atheromatous disease was found to be somewhat greater among the negro patients than among the white, a difference which is more significant if the fact be taken into consideration that the average age at the time of death was greater among the whites. Attention has previously been directed to the fact that arterial degeneracy is especially common among colored races, and our results seem to corroborate this view.

Sex.—The *females* of both races seem more liable to the disease than do the males, contrary to what is usually taught; the difference, however, is slight, and the number of cases not sufficiently large to establish a general rule. I would mention in this connection, however, that, as previously reported, we have found renal diseases also more common among the *females* of both races.

Age obviously plays an important part in the development of arterial degeneracy, the average age at time of death of the patients showing no disease being thirty-two; of those exhibiting acute early stages of the affection, forty-one; of those in whom the disease was well advanced and widely diffused, fifty-five. The youngest patient in whom well-marked atheromatous disease of the aorta was found was twenty-one; the youngest showing a high grade of the disease with extensive distribution was forty-three.

Causes of Death.—An analysis of the causes of death in the two hundred cases brings to light some interesting facts. Among the non-atheromatous the deaths were chiefly due to tuberculosis, acute diseases, including acute nephritis and epilepsy, cerebral hemorrhage, heart-disease; chronic renal affections being conspicuously absent. In the second group the causes of death are tuberculosis, acute diseases, nephritic troubles, both acute and chronic, valvular heart lesions, general paresis, and one death from cerebral meningeal hemorrhage, with several other instances of subdural effusion of blood. When we reach group three—the markedly atheromatous—chronic forms of renal disease become conspicuously frequent, and of the fifty-five cases in this group, five died directly from intracranial hemorrhage, and in eleven other cases subdural hemorrhage (“pachymeningitis interna hemorrhagica”) was noted. Heart complications were also more common. In short, the non-atheromatous die of acute disease, and suffer rarely from chronic renal disorder, heart complications, and cerebral hemorrhage; the

atheromatous die of chronic diseases, renal especially, have frequent heart disorder, and cerebral hemorrhage is common.

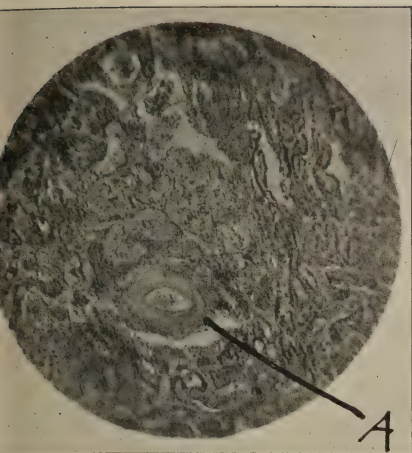
Character and Distribution of the Lesions.—As above noted, in about one-third of the whole number of cases examined, the lesions are confined to the aorta, favorite situations of the splotches being the orifices of the intercostal arteries, the bifurcation of the abdominal aorta at the pelvic brim, and the first inch of the aorta, near the bases of the heart-valves, and around the openings of the coronary arteries; but in those cases in which the disease in the aorta is at all well marked, the degeneration can be traced into the smaller arterial branches.

Thus, in fifty-five atheromatous cases in group three, there was sclerosis and atheroma of the coronary arteries in thirty-six, of the larger cerebral arteries in thirty-five, and in the forty-two cases of this group in which sections of the kidneys were made and examined with the microscope, disease of the renal arteries was noted in thirty-six instances. No cases showing disease of the coronary arteries, of the cerebral arteries, or of the smaller renal branches, failed to show the lesion in a higher degree in the aorta. Disintegration of the atheromatous plaques, with the irregular, depressed "ulcers" consequent therefrom, were noted in five cases only; in none of these were emboli discovered. Calcareous plates or irregular, chalky deposits were much more common,—seen in eleven of the fifty-five cases; and in two cases many of the arteries, including the cerebral, could be broken like pipe-stems, the entire wall being infiltrated with calcareous matter, rigid and unyielding. In one case a large aortic aneurism was found.

Some morphological differences exist between the sclerotic degenerative changes noted in the larger arteries and those occurring in some of the smaller vessels. It is especially in the larger vessels that the atheromatous areas, ulcers, calcareous plates, etc., are seen, and here the disease affects the inner arterial coat in particular. In the smaller vessels of the kidney, heart, liver, spleen, etc., the histological changes commonly assume the form of "arterio-capillary fibrosis," described in the oft-quoted work of Gull and Sutton. Here there is a diffuse fibroid or hyaline thickening of the adventitial coat as well as of the intima, and the muscular layers show frequent atrophic changes, these changes in the blood-vessel wall being often associated with thickenings and general increase in connective-tissue framework of the several organs.

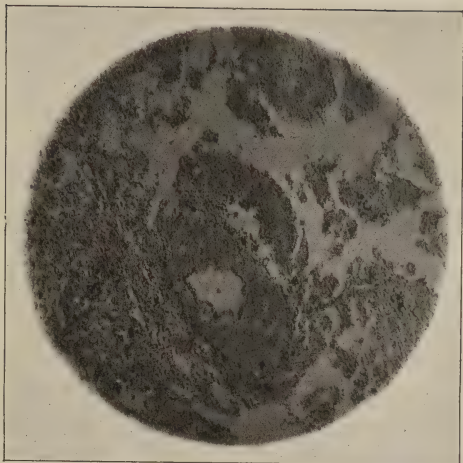
The changes of atheroma and "arterio-capillary fibrosis," while differing in histological character, have a probably common etiological origin. The differences seem to depend largely upon the structure and relations of the vessel affected. When the arteries lie comparatively free, having not very intimate relation with surrounding tissues (aorta and large arteries in thoracic and abdominal cavities, meningeal arteries, etc.), the irregularly distributed atheromatous patch is common, and adventitial thickening is not pronounced. When the arteries lie within and intimately connected with

FIG. 5.



Section of arterio-sclerotic kidney showing at A transverse section of small artery with hyaline-thickening of its walls, $\times 250$. From a case of general arterio-sclerosis with atheroma and degenerative changes in entire arterial system.

FIG. 6.



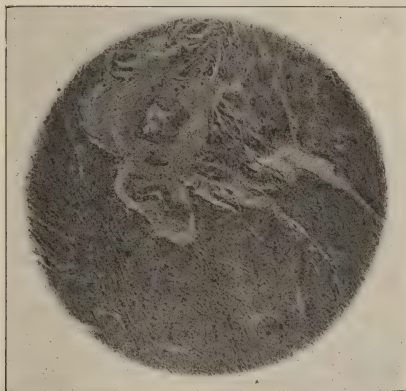
Transverse section of small artery in spleen, showing hyaline thickening of walls of the vessel. From a case of general arterio-sclerosis, $\times 250$.

FIG. 7.



Cirrhotic liver, with thickening of walls of the blood-vessels, $\times 50$. From a case of general arterio-sclerosis.

FIG. 8.



Section of wall of left ventricle of the heart, showing fibroid thickening of small blood-vessels, $\times 150$. From a case of general arterio-sclerosis.

the stroma and cells of the glandular organs, kidney, liver, etc., adventitial thickenings and the diffuse hyaline and fibroid degeneration above referred to become more evident.

Whether in these glandular organs the thickening begins in the blood-vessels and extends secondarily to connective-tissue framework, or, occurring primarily in the latter, extends at a later period to the blood-vessels, is not in all cases determinable; probably in many instances the changes are simultaneous, and due to a common cause. In some undoubtedly the primary lesion is in the vessel walls.

Heart.—A frequent situation of early atheromatous disease, as noted above, is the first inch of the aorta, so it is not surprising that, as the disease advances, it invades not only the remainder of the arterial system, but extends to the valves and endothelial lining of the heart as well. A large percentage of the cases in group three show atheromatous degenerative changes in small, oval or irregular, yellowish, raised or thickened patches upon that segment of the mitral valve which is, at its base, continuous with the inner surface of the aorta, and, in a smaller number of cases, the lesion is noted upon the remainder of the mitral valve, upon the cusps of the aortic valve, and upon the endocardium. The bases of the aortic cusps are not rarely involved. Calcareous masses and plaques upon valves and endocardial lining have also been noted, and in some cases where the yellowish atheromatous plaque was not noticeable, a diffuse sclerosis and stiffening of the valves of the left side of the heart have been present. This extension of the disease to the valves of the heart was noted in twenty-six out of the fifty-five atheromatous cases.

The frequency of atheroma of the coronary arteries has been previously alluded to. The heart muscle, in many cases, probably in consequence of the increased demand made upon it as a result of the diminished elasticity of the arterial system, as well as, in certain cases, by insufficiency of the cardiac valves, becomes hypertrophied, the weight in twenty-five per cent. of the fifty-five cases being more than twelve ounces, the six largest hearts weighing, freed from blood-clots, twenty-six and a quarter, twenty and a quarter, nineteen and three-quarters, eighteen and three-quarters, sixteen, and fifteen ounces. This cardiac hypertrophy, however, is not by any means a universal accompaniment of arterial disease or of valvular heart lesion, even when these two are combined with arterio-sclerotic nephritis, for of our atheromatous cases, quite thirty per cent. showed hearts weighing less than eight ounces; and among these were many instances of valvular heart lesion also. These small atrophic hearts were usually found in subjects in which a general marasmatic state prevailed; many of them, undoubtedly, showed degenerative changes in their muscular tissue. Reckoning all together, the average weight of the heart among the atheromatous is less than among the non-atheromatous.

Among some seven hundred white patients examined by my colleague, Dr. Ruffin A. Wright, in course of an inquiry into the cardiac complica-

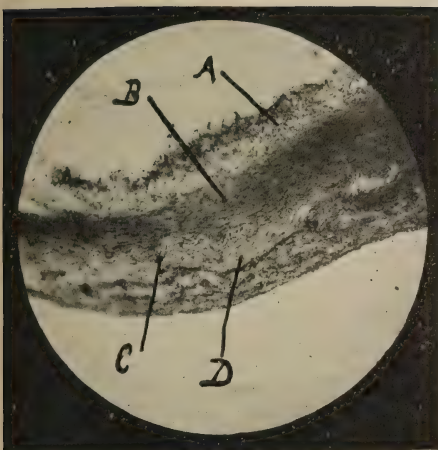
tions of insanity, evidences of organic heart lesion were discovered in about eleven per cent., and of this eleven per cent. a large proportion also exhibited some indication of arterial degeneracy; the proportion of cardiac valvular disorder among the non-atheromatous being infinitely less than among those showing diseased arteries. Of our fifty-five fatal atheromatous cases, cardiac lesion had been detected before death in *eighteen*. Almost without exception, the cases in which heart lesions had been recognized by examination before death exhibited at post-mortem examination some degree of arterial sclerosis.

Kidneys.—Practically every one of the atheromatous cases exhibited renal disease, the commonly noted condition being the “red granular” arterio-sclerotic contracted kidney, the organs being smaller than normal, firmer, of a dark red, capsule thickened and adherent, bringing away bits of tissue when stripped off, and leaving behind the characteristic “red granular” surface. The cut surface of the kidney is red, cortex irregularly thinned, the markings indistinct, pyramids dark colored. The chief lesions shown under the microscope are: thickening of interstitial tissue, thickening of arterial walls, of capsules of glomeruli, destruction of many tufts through degenerative changes in their component vessels, and degenerative changes in the tubal epithelial cells, the latter lesion varying much in different cases. This description would apply with scarcely a change to about two-thirds of the kidneys in our cases of endarteritis. The remaining third, while almost without exception exhibiting disease of their arteries, depart in some particulars from the arterio-sclerotic type. Many of these variations are obviously due to intercurrent acute forms of nephritic disease, to which, naturally, the arterio-sclerotic kidney is as liable as is a more nearly normal organ, or even more liable. In seven of these atypic cases, in which there was disease of the renal arteries without the characteristic “red granular” appearance, the causes of death were peritonitis (two cases), pneumonia (two cases), septicæmia (one case), and miliary tuberculosis (two cases), in each of which seven cases there was, in consequence of the acute disease, an acute exacerbation of renal disorder.

In only two cases was there pronounced disease in the aorta and in the smaller arteries of other portions of the body—coronaries, cerebral vessels, etc.—without degenerative or fibroid changes in the renal vessels. In the forms of early and but slightly advanced atheroma included under group two, however, the renal vessels were, as a rule, free from disease. In no instance was a “red granular” kidney found, or a kidney showing any degree of degenerative change in arteries, or any “arterio-capillary fibrosis,” without atheroma in other portions of the arterial system.

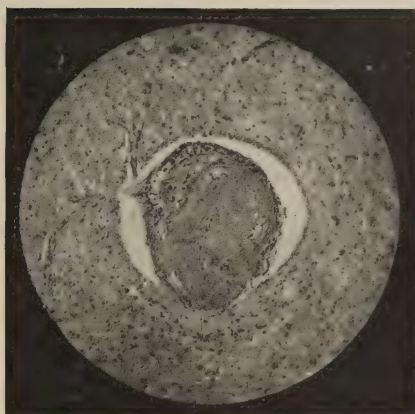
Among the cases free of arterial disease, or showing this disease in minor degrees, the average weight of the kidneys was greater, and the percentage of nephritic disease somewhat smaller. The renal disease, too, when present, was most often of an acute form, or of a chronic parenchymatous form, without affection of the renal blood-vessels.

FIG. 9.



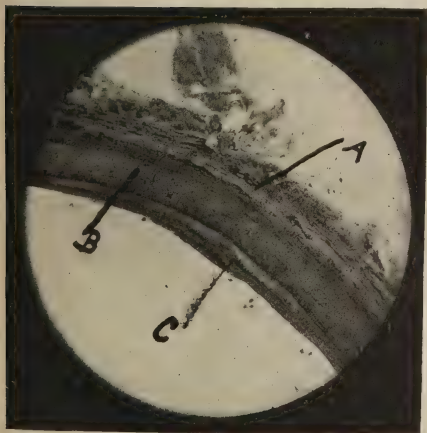
Portion of the wall of middle cerebral artery, from same case as Fig. 1 *et seq.*: A, adventitia; B, media; C, lamina cribrosa; D, greatly thickened intima, its innermost portion thickly infiltrated with round cells. Leitz, No. 4 objective, No. 1 ocular, \times about 175.

FIG. 10.



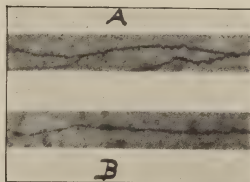
Transverse section of small artery in corpus striatum, from a case of general arterial degeneracy, with great dementia, dying of cerebral hemorrhage. There is irregular thickening of the arterial wall with narrowing of lumen of the vessel, \times 175.

FIG. 11.



Section of wall of abdominal aorta through an "atheromatous plaque." A, adventitia; B, media; C, intima, at point of atheromatous thickening, \times 60.

FIG. 12.



A, portion of dendron of a pyramidal cell in cortex cerebri, normal; B, portion of dendron of cortical pyramidal cell from a case of dementia with general arterio-sclerosis, showing fusiform swellings and denudation of gemmulae. Berkeley's phospho-molybdate of silver stain. Leitz, No. 7 objective, no eye-piece, \times about 400.

The urine was found to contain albumin as well as renal tube-casts in every case showing arterial atheroma in an advanced stage.

Brain.—The condition of the brain in cases of advanced atheroma is commonly one of sclerosis and atrophy. Among the non-atheromatous or slightly atheromatous cases the average weight of one hundred and forty-five brains is forty-four ounces; among these were many general paretics. Among those who show atheroma in marked degree, fifty-five cases, the weight averages forty-two ounces. In many of these brains the atrophy, the shrinking of the convolutions of the vertex, gaping of sulci, general hardening of the tissue, etc., are extreme. The lightest of the atheromatous brains weighed thirty-two, thirty-three and one-half, thirty-four and one-quarter, thirty-five, thirty-seven, and thirty-seven and one-half ounces respectively. Occasionally a brain in which there is disease of the arteries will show no atrophy; occasionally atrophy of a brain will be noted without degenerative disease of the arteries, but usually when there is arterial degeneracy there is cerebral atrophy; when there is cerebral atrophy there is some degenerative arterial disease. The indications of disease in the histological elements noted in microscopic study of sections of the brain from cases of arterio-sclerosis are, briefly, those described in senile and terminal dementia,—destruction of many nerve-cells, degenerative changes in other nerve-cells, thickenings in smaller blood-vessels, changes in neuroglia-tissue elements, etc. The miliary aneurisms, upon the occurrence of which so much stress has been laid by some, have been conspicuous by their absence, or at least we have failed to detect them. A not uncommon lesion in advanced cases is granular thickening of the ependymal lining of the ventricles.

The pia-arachnoid has usually been found thickened, opalescent, tough, dense, œdematous, being often removable in large sheets without difficulty. A frequent lesion is intrapial or subdural hemorrhage, which, like intracerebral effusions of blood, have been rarely noted except in cases exhibiting disease of the arterial system. Thus, in our two hundred autopsies, nineteen instances of subdural or intrapial hemorrhage were discovered, and in eleven of these there was a high grade of atheroma throughout the arterial system; in seven other cases earlier stages of arterial degeneracy, and in one instance only was no degenerative change in the blood-vessels noted. In addition to these meningeal hemorrhages, there were five cases of intracerebral effusion, three of these occurring in basal ganglia or internal capsule, one in the white substance of a cerebral hemisphere, one in the pons. Each was the direct cause of death, as noted above, and in each there was disease of the arteries.

The very frequent occurrence of arterial disease among general paralytics has been made the subject of remark by Beadles and others. A review of the lesions noted post mortem in our cases of paresis confirms this opinion in so far as the frequent existence of arterial degenerative changes is concerned, almost every case of paresis showing some arterial disease. I would say, however, that in no instance have we found the degenerative changes

well marked, not one of our fatal paresis cases falling under our atheromatous "group 3." In two of the cases no arterial degeneracy was noted. The six other cases did exhibit an early stage of disease.

Condition of other Organs.—The *liver* has usually been found smaller and firmer than normal,—i.e., cirrhotic,—and no case of hepatic cirrhosis without general arterial disease, as well as similar disease of kidneys, heart, brain, etc., has been seen.

The spleen also in the majority of cases is firmer, smaller, harder, more fibrous than normal, save in the cases dying of infectious disease. The suprarenal capsules are often dry, firm, shrunken, with brilliant yellow cortex and dark-red medullary substance, the color contrast greater than normal. The ribs, and to a less noticeable extent the other portions of the osseous system, are atrophic, softened, show diminution or even absence of inorganic salts, and break or bend easily.

The most striking general feature of the bodily condition is emaciation, with marasmatic atrophy, and the changes already familiar as accompaniments of senility, and this chronic degenerative disease in the arteries may be regarded as one of the most characteristic pathological features of that chronic, progressive, incurable disease, old age.

It is also worthy of note that the cases of endarteritis showing most typically the marasmatic state above referred to are usually those in which the nephritic complication is most pronounced. Occasionally, when renal or other complication is not pronounced, the subjects remain in a remarkably well-nourished state to the last.

Clinical Symptoms.—The existence of any considerable degree of arterio-sclerosis is generally recognizable during the life of the patient, although early stages of the malady do not make their presence manifest. In advanced cases there is the well-known sclerosis of the arteries, perceptible in radial, facial, temporal, and other arteries which can be felt. The arteries are also tortuous and the pulse harder and less compressible. The heart-sounds are apt to be roughened, and distinct murmurs are not rare. (Note above that in fifty-five atheromatous cases autopsied, heart murmurs had been recognized during life in eighteen.) The roughness is noted with both first and second sounds, there is accentuation of the aortic tone; the murmurs are chiefly systolic.

The *arcus senilis* is often present, and has not yet been by us observed in a case free from arterial degeneracy. Hemorrhagic or petechial spots upon the skin—most usually the forearms and the back of the hands—are common, and are obviously hemorrhages, and in many cases not obviously due to traumatism. One man, the subject of great arterial disease and dying of cerebral hemorrhage, had a crop of small, irregular hemorrhagic splotches over chest, face, and extremities two days before death; another had a similar abundant crop upon face, neck, and body, appearing without discoverable exciting cause, and slowly disappearing by absorption. A female patient having an extensive and well-marked arterial disease with

nephritic, hepatic, and cardiac complications, had, three weeks before death, an extensive hemorrhagic effusion into the skin of the abdominal wall, the splotch being something near one square foot in extent; it was gradually absorbed, passing through the stages of discoloration shown during absorption of blood effused after a bruise. These hemorrhages, when not due to trauma, we may regard as of angio-neurotic origin, but arterial degeneracy seems in either case necessary to their occurrence. We have noted *no case* in which there was no disease of the arteries.

Other symptoms shown in these cases are vertigo, buzzing in the ears, easy exhaustion, palpitation of heart, irregularity of same, attacks of syncope, etc., these occurring particularly where there is cardiac disease. The cirrhotic liver and the diseased kidneys also contribute their quota of symptoms, chronic uræmic manifestations being especially common.

The urine is in advanced cases invariably albuminous and invariably contains tube-casts.

Delafield and Prudden make reference to the occasional development, in serious arterio-sclerosis, of symptoms almost identical with those shown in cerebral hemorrhage. One such instance has fallen under notice here. A patient suffering from advanced arterial disease developed a progressive hemiplegia (becoming in its later stages bilateral), and the symptoms of extravasation were so well marked as to lead to diagnosis of hemorrhage into brain. The autopsy discovered no hemorrhage whatever, but a high grade of arterial disease in all arteries, with calcareous deposits and partial obliteration of many of the cerebral twigs.

Among the causes of arterio-sclerosis, poisons in the blood exerting a direct irritant action upon the vessel wall have long been accorded a prominent place. These poisons may be such as are introduced into the system from without, as alcohol, opium, and other habitually-used stimulants or narcotics, lead, etc., or may result from diathetic or acute or chronic infectious diseases, as syphilis, rheumatism, gout, or may be developed in the body, as in intestinal auto-infection or "uræmia" from defective excretion of waste products.

These last-mentioned states of auto-poisoning probably play a greater part in the causation of the arterial degenerative changes under consideration than has heretofore been recognized.

We are coming slowly to an adequate appreciation of the frequency of these states of auto-infection among the insane, and to recognize their important influence upon the functional activities of the brain and other organs. Attention has been several times directed to the common occurrence among insane people of nephritic disorders with their accompanying uræmic symptoms. If, as seems abundantly justifiable, we may assume that toxic-blood states favor the development of arterial sclerosis and degeneracy, we have in the frequently noted auto-infections among the insane a sufficient reason for the frequent occurrence of arterio-sclerosis among the same class.

The probable origin of these arterial degenerative diseases in chronic infection offers also reasonable explanation of the otherwise scarcely explicable although long-observed relationship between Bright's disease, heart-disease, and hepatic cirrhosis, and between these three and arterial degeneration.

The presence in the blood of substances which exert an irritant or injurious influence upon the vessel walls must produce a somewhat similar effect upon the cells of the brain, kidneys, liver, and other organs, and must result sooner or later in pathological changes readily recognizable upon examination, such as atheromatous and fibroid degenerations in the walls of the blood-vessels; degenerations or parenchymatous metamorphoses in the cells of the kidney, liver, etc., together with changes in connective-tissue elements (thickening and increase in); degenerative changes in the nerve-cells, with cerebral atrophy, as noted in terminal and senile dementia.

A given degree of toxæmia will act by no means uniformly throughout the animal organism, the points of greatest pathological activity depending probably upon inherent power of resistance of the different organs and tissues, which resistive power necessarily varies with the individual. In one having an unstable cerebral organization the cortical cell will suffer prominently, resulting in perversions of cerebral function, mental disorders, or in insanity, or permanent dementia if the toxic state be severe or long continued. In another the renal cells may be most affected, leading to sundry forms of nephritic disease; or the hepatic tissue may show greatest changes, as in the cases in which cirrhosis of the liver is prominent; or the blood-vessels themselves may be chiefly diseased. Usually the result in any case is a combination of the pathological effects above referred to. Whatever the initial toxæmia may be due to, in later stages there is added the poison of defective excretion whenever the kidneys become diseased, together with the ill effects of disordered heart action, of diminished arterial elasticity, of derangement of the nervous mechanism, etc. We find, in short, that those forms of Bright's disease in which there is endarteritis or arterio-capillary fibrosis of the renal vessels occur only in patients suffering from general arterial sclerosis; that atheromatous, chronic, sclerotic, and degenerative disease of the cardiac valves and endocardium is usually accompanied by similar changes, in a higher degree and more advanced stage, in the arteries; that in all cases of chronic Bright's disease which in their later stages become complicated by cardiac hypertrophy of valvular disease, widely distributed atheromatous or sclerotic arterial degeneracy is present.

It would seem, then, that the more constant and characteristic pathological condition in these cases is the arterial disease, a point which has been insisted upon by many who have studied the subject and apparently confirmed by our results here.

Bright's disease, then, does not cause disease of the heart, but the two, together with the cirrhotic changes in other internal organs and the degen-

erative changes in the arterial system, represent concurrent results of a common cause,—toxæmia.

What relation exists between sclerotic degenerative disease of the arteries and mental disorder? Probably an intimate one. No brain whose arteries are atheromatous is as well nourished, active, and fit for work as is the brain supplied by more normal vessels, a fact equally true of the sane and the insane. With sclerosis and atheroma we have the inevitable loss of elasticity in the cerebral arterial twigs, cardiac weakness or insufficiency, with general circulatory disorder; disease of the kidneys with its resultant auto-poisoning, as well as cirrhotic changes in the liver and other organs, and behind and above all the initial toxic state to which the complex of pathological changes is presumptively due. Under such unfavorable circumstances the cortical cell must necessarily suffer. That demonstrable changes in the nerve-cells of the brain do occur is shown by examination of the cortical tissue after staining by the Nissl method, and in preparations made by the Golgi silver process, and by Berkley's modification of the same. These cellular degenerative changes, as previously mentioned, are those already becoming familiar as the pathologico-anatomical basis of terminal dementia and of the senile insanities, and will not be entered upon in detail here, but may form a part of a subsequent report. In this connection some of Berkley's recently published work is interesting ("Lesions of Cortical Tissues caused by Acute Experimental Alcoholic Poisoning," *Journal of Nervous and Mental Diseases*, April, 1896) as showing "the large dependence of the lesions of the nerve elements upon the vascular," "all the alterations of importance being in the neighborhood of damaged vessels." What is true of acute alcoholic poisoning is probably true in at least a measurable degree of chronic poisoning from alcohol and other toxic agents. Regarded as a result of continued toxæmia, and a phase of the pathological anatomy of chronic poisoning not improbably occurring at an earlier date than the degenerations of the nerve-cells of the cortex, the subject of arterio-sclerosis assumes a renewed interest, and should be accorded an important place in the pathological anatomy of insanity.

Reviewing our two hundred cases, it is noticeable that the non-atheromatous insane suffer from acute forms of mental disorders; the atheromatous from chronic and incurable forms; when in the atheromatous, as sometimes occurs, there is an acute outbreak of mania or melancholia, the underlying mental dulling is generally noticeable. In short, the characteristic and ever present mental expression of arterio-sclerosis is *dementia* of some kind and degree.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

The Quantitative Determination of the Hydrochloric Acid in Human Gastric Juice. (*Deutsches Archiv für klinische Medicin*, Band lvi. p. 87, 1895.) By Hermann Strauss, M.D.

A very careful comparative study of the various methods in common use is made, and the following conclusions of their relative value are reached.

1. The reaction with dimethylamidoazobenzol is easily carried out, and has few complications.

2. The recognition of the dividing line is relatively difficult in the dimethylamidoazobenzol reaction on account of the gradual character of the change. It requires considerable practice, and the result is much affected by the personal equation of the investigator on account of the difference in the development of the color sense. The application of the method of titrating with an aqueous one per cent. solution of congo red does not give as gradual a boundary if the end of the reaction is considered to be the moment when the addition of a drop of gastric contents to the indicator does not cause an immediate blue-black discoloration at the line of contact of the two liquids.

3. A five-tenths per cent. alcoholic dimethylamidoazobenzol solution and a one-per-cent. aqueous solution of congo red are, in regard to their sensitiveness to free hydrochloric acid in human gastric juice, more delicate than Günzburger's reagent and congo paper. The solution of dimethylamidoazobenzol is, like the solution of congo red, more sensitive than paper that has been saturated with it.

4. Both indicators appear to act only upon uncombined hydrochloric acid.

5. Solutions of acid phosphates concentrated to five-tenths per cent. or more produce a change of color with dimethylamidoazobenzol solution, or one-per-cent. solution of congo red, that, although not identical with that

produced by minute quantities of free hydrochloric acid, is so similar as to be easily confused with it.

6. Organic acids, particularly lactic acid, have in concentrations, such as occur in pathological human gastric contents, the quality of giving a positive reaction with both indicators.

7. A one-per-cent. solution of congo red is more sensitive to all the substances that have been mentioned than the dimethylamidoazobenzol solution. It possesses all the advantages, but also all the disadvantages in still higher degree than the latter.

As congo paper is usually very slightly sensitive to organic acids in the degree of concentration in which they are usually found in the gastric juice, it is a very valuable reagent for merely qualitative work. In conclusion Strauss gives a few statistics concerning the relative frequency of persistent failure of free hydrochloric acid in the gastric contents after a test breakfast. In one hundred and seventy cases that he examined in Giessen, in none of which carcinoma was present, it was absent eight times, and in five also after a test meal. In one hundred and fifty-four non-carcinomatous cases, to whom the test meal had been given, it was absent twelve times. In Berlin, on the other hand, ninety-two cases were examined with the test breakfast, and twenty-five failed persistently to give the hydrochloric acid action. The average total acidity of the cases examined with the test breakfast in Giessen was forty-seven, and for the cases in Berlin, thirty-seven.

Vasomotor Œdema without Albuminuria. (*Revue de Médecine*, August 10, 1895.) By Professor B. Tchirkoff, of Kiew.

Six cases of this interesting condition were observed by the author between the years 1886 and 1894. The clinical history differs according as the subjects were anæmic or plethoric before the commencement of the disease: in the former case the œdema developed slowly; in the latter, very rapidly. Anasarca usually develops as the earliest symptom; then ascites supervenes, giving the picture of cirrhosis of the liver, later the other serous cavities become filled and serious pressure symptoms develop. Some of the invalids lose the hair from the face, the pubis, and the scalp. There is never the slightest trace of albumin in the urine, and the blood is normal in respect to the number of red cells and the proportion of hæmoglobin; nor was there in any case cardiac disease of such a nature as to account for the œdema. Usually, however, the blood contained a considerable proportion of reduced hæmoglobin, as if it were insufficiently oxidized in the lungs. After recovery the patients were invariably extremely weak and emaciated. One of the most interesting cases is that of a Jew, of forty-eight years, who had suffered from a slight gastritis. Two years after this attack, œdema developed in both feet. In the course of a few weeks the skin became everywhere œdematous, and there was a considerable collection of liquid in the peritoneal, pleural, and pericardial cavities. There

was no pulmonary œdema, and the urine and blood were both normal. Two cases of this character that had had syphilis had improved rapidly under iodide of potassium, and although there was no history of syphilis in the present case, the same drug was administered with prompt and permanent relief. Three years later the patient had a stroke of apoplexy, followed by left hemiplegia. A second patient presented almost identical symptoms, with, in addition, diminution of the red cells, leucocytosis, and an enormous quantity of reduced hæmoglobin in the blood. Potassium iodide was again rapidly effective. A third case was that of a physician suffering from syphilis of six years' duration; the symptoms resembled those of the other two patients, and were rapidly cured by mercurial inunctions. Tchirkoff formulates his conclusions as follows: 1. There exists a form of disease characterized by general œdema and effusion into the serous cavities; but in which the urine contains no albumin, and the heart, lungs, liver, and other organs present no modifications that could cause the œdema. 2. These œdemas are of vasomotor origin, and may be called "general vasomotor œdema." 3. They are often associated with dilatation of the right heart and moderate arterio-sclerosis. 4. They are always accompanied by modifications of the blood,—that is to say, the blood is reduced, but in addition to this trophic phenomena and pronounced paralysis of the cutaneous veins are often observed. 5. In the majority of cases the œdema is of syphilitic origin, and yields to mercury or the iodides.

Contribution to the Study of Endocardial Efflorescences in Tubercular Patients. (*Centralblatt für Allgemeine Pathologie und pathologische Anatomie*, February 23, 1895.) By Dr. Biondi, of Florence.

It has lately been maintained that a genuine tubercular endocarditis exists. To reach some definite conclusion upon this subject, Biondi studied a number of endocardial efflorescences that occurred in tubercular patients. In all cases the endocardium appeared to be normal, and the nuclei of the endothelial cells stained well; and neither hyaline necrosis nor small-cell infiltration was ever found. The vegetations were variously formed, sometimes they consisted of a homogeneous or slightly granular mass, through which fibrous strands passed in various directions, and occasionally between these trabeculæ or in the substance of the mass itself, small cavities were found filled with white and red corpuscles. In other cases groups of larger cells were found at the base of the vegetations (fibroblasts), but there was never even a distant resemblance to the structure of a tubercle. Tubercle bacilli were never found, and other microbes in only three instances, these being always cocci and lodged in the periphery of the vegetations. The author concludes that in these cases it would be improper to speak of a tubercular endocarditis, or even of a microbic endocarditis following secondary infection from a cavity or the intestinal tract; nor, since the endocardium beneath the vegetations was normal, can one speak of a healed secondary endocarditis. He therefore decides that the vegetations are identical with

the endocardial efflorescences described by Ziegler, which are really due to an alteration of the endocardium with the formation of hyaline thrombi and the deposit of fibrin. The slight alteration of the endocardium that is required to cause these growths can easily occur in exhausting diseases, such as the cachexias of tuberculosis or malignant tumors, and as a result marantic thrombi occur. To the nine cases of tuberculosis, Biondi adds two of carcinoma cachexia in which he found the same alterations. As a result of his work, he believes that true tuberculous endocarditis, if it ever occur, must be uncommon, since in none of nine cases did he find any indication of it; and further, that lesions of marantic origin in tuberculosis have been neglected.

Endocarditis and Pyæmia produced by the Bacterium Coli Communis. (*Wiener klinische Wochenschrift*, April 30, 1896, No. 18.) By Fritz Hitschmann, M.D., and Edward Michel, M.D., of Vienna.

The patient had suffered for a year from weakness and shortness of breath. Micturition had been difficult since an attack of gonorrhœa in early life. Examination revealed an aortic insufficiency, atheroma of the vessels, and a condition diagnosed as incipient tabes. On account of the urethral stricture he was transferred to the venereal department, where, after a difficult catheterization, he had a chill followed by high fever. A bacteriological examination of the blood made at this time was negative. Six days later a second chill occurred, followed by marked leucocytosis. The patient became jaundiced, ecchymosis appeared upon the skin, and death occurred finally from the septicopyæmia. The pathological diagnosis was as follows: Ulcerative endocarditis of the aortic valves, verrucose endocarditis of the mitral and tricuspid valves. Rupture of the aorta with the formation of a false aneurism. Pyæmic infarcts of the lung, spleen, and kidneys. False passage in the urethra. Bacteriological examination of the endocardium, the infarcts, and the cutaneous hemorrhages showed the presence of the bacterium coli communis exclusively. Histological examination of the tissues revealed the presence of bacteria in every respect similar to these. In the tissue of the urethra three forms of bacteria were found,—cocci, short bacilli with rounded ends, and long, slender bacilli forming threads. Cultures were not made from the urethra. The authors believe that three possibilities exist: 1, that the bacillus coli communis infected the wounded urethra from the first, and thence entered the circulation; 2, that the primary urethral infection was due to the cocci, and that the bacterium coli communis infected it later, but that the latter alone entered the circulation; 3, that the streptococci first produced the general infection, and that the bacterium coli communis entered the circulation later. From a consideration of the various features of the case, they consider that the first theory is probably the true explanation. The infection of the urethra by the bacterium coli communis is easily explained by supposing that the instruments were either unclean or that the organism

was present in the urethra before the injury. As, after a careful search of the literature, Herren Hitschmann and Michel have been unable to find any other case of endocarditis in which the cause is clearly proved to be the bacterium coli, they claim the credit of having reported the first case.

A Case of Acute Strumitis caused by the Diplococcus of Fränkel-Weichselbaum, with Secondary Metastatic Pneumonia. (*Münchener medicinische Wochenschrift*, May 26, 1896.) By Dr. Heddæus, of Heidelberg.

The patient had had an enlargement of the thyroid gland for two years, which gradually produced dyspnœa by pressure upon the trachea. Eight days before admission an exploratory puncture had been made, afterwards the dyspnœa rapidly increased, the gland became tender, and fever developed. Upon admission there were extreme dyspnœa, aphonia, a stenotic bruit in the trachea, and the tumor presented marked fluctuation. The following day the cyst was enucleated and found to contain a thin hemorrhagic liquid with infiltrated walls. Cultures made from the liquid were found to consist exclusively of typical Fränkel-Weichselbaum bacilli. On the third day after the operation the physical signs of pneumonia were found in the right middle lobe and the sputum was found to contain an enormous number of typical Fränkel-Weichselbaum bacilli. The wound healed rapidly and the pneumonia underwent the crisis at the fifth day. Subsequently aphonia again developed, probably due to the retraction of the scar.

Heddæus discusses whether the infection was caused by the instrument used in making the exploratory puncture or whether it merely acted as a predisposing agent by injuring the tissue of the gland, the infectious element entering by some other channel. Accepting the latter view, it becomes interesting to consider how the bacilli had entered the system. It is unlikely that the point of entrance was the mouth, for it has never been demonstrated that infection takes place from this locality; nor can the lungs be considered as the source of infection, as the pneumonia was manifestly secondary to the strumitis, and probably embolic. It must, therefore, be accepted, although not proved, that the original inoculation occurred from the unclean instrument used in making the puncture.

Investigation of the Tissue Metamorphosis in Acute Yellow Atrophy of the Liver. (*Berliner klinische Wochenschrift*, May 25, 1896.) By Paul Friedrich Richter, M.D.

The first patient was a woman of twenty-eight years of age, with a recently acquired hard chancre. Three weeks after infection icterus appeared, soon the liver began to lose in volume and become tender, and fourteen days later death occurred. The autopsy confirmed the diagnosis of acute yellow atrophy. During the two weeks preceding death, daily examinations had been made of the urine to determine the amount of urea, ammonia, the

alloxan bodies, and uric acid that was excreted. The results are given in the nitrogen equivalents of these substances. The total quantity of nitrogen was normal excepting upon the thirteenth and fourteenth days. The urea was also diminished upon the last two days. As the coma commenced upon the tenth day, it cannot have been due to a uræmic condition. The actual course of affairs was probably as follows: The liver acts as a barrier to protect the organism from the toxic products of tissue metamorphosis. The first effect of its exclusion, therefore, is an intoxication of which the cause is unknown. As a result of this intoxication a state of coma develops and the secretion of urea is affected secondarily to this. The quantity of ammonia in the urine was slightly increased. This frequently occurs in fevers and other conditions where there is an undue production of acid, and that this undue production occurred in the present case was shown by the diminished alkalinity of the blood, which equalled only two hundred and twelve milligrammes of sodium hydrate titrated according to the method of Löwy. The excretion of uric acid and the so-called alloxan bodies was usually considerably increased, in accordance with the results of experiments upon animals. The cause of this may be sought in the necrosis of the nuclei of the cells of the hepatic parenchyma and the uric acid formed from the nuclein set free in this manner. It is unlikely, however, that this alone accounts for the formation of urea, as Horbaczewski maintains; particularly as, in this case, the quantity was very irregular, and by no means greatest on those days when the physical signs indicated that the degeneration of the liver was most rapid. In the latter days of the disease, when the nourishment was purely milk, the total amount of nitrogen ingested equalled on the average about 3.5 grammes *per diem*, and the total amount of nitrogen excreted equalled about ten grammes *per diem*, showing the great destruction of tissue in the organism.

The second patient was a woman of twenty-two years, with syphilis of six months' standing. Gastric disturbances lasted thirty-six days, then icterus appeared, and thirteen days later the liver was found to be tender and smaller. Six days later coma developed, and in three days death. Tyrosin could be recognized in the urine, even on the last day, contrary to the results of the first case, where neither tyrosin nor leucin could be demonstrated. The autopsy confirmed the diagnosis of acute yellow atrophy, and the microscopical examination showed complete atrophy of the parenchyma of the liver. The urine was examined from the time when the diagnosis was first made nine days before death, for five days, and the results confirmed in every respect the results obtained in the previous case. Richter concludes, in contradiction to Münzer, von Noorden, Weinhand, and others, that other organs than the liver take part in the formation of urea, and in case of destruction of the hepatic tissue they may vicariously supply its place almost completely.

Hemorrhages: Their Relation to Barometric Pressure. (*British Medical Journal*, May 30, 1896.) By Thomal Whitelaw, M.D., of Edinburgh.

The author reports fifteen cases in which hemorrhage occurred, either for the first time or after an interval, at a period when the barometric pressure was unusually high. Earlier notes of cases, that were unfortunately lost, confirmed the conclusion that "there is a marked affinity between a high barometer and hemorrhages of various kinds."

A Case of Lymphangiectasia and Lymphorrhagia: Contribution to the Casuistic of Lymphangiectasia. (*Deutsches Archiv für klinische Medicin*, vol. lvi. p. 402, March 26, 1896.) By J. Haferkorn, M.D., of Dresden.

The patient was a girl of eleven years without hereditary taint. At the age of seven years, after an attack of scarlatinal diphtheria, the parents noticed that the right leg was larger than the left. Later a white discharge occurred from the vagina, amounting at times to a half litre. Otherwise the child was perfectly normal, and the lymph-glands were not enlarged. The right labium majus was much swollen and covered lines of nodulated blisters of yellowish-white translucency, the largest being about the size of a pea. A few small blisters were also found upon the left labium and upon the clitoris, but the hymen and nymphæ were free. The internal sexual organs presented no anomaly. The blood and urine were normal, and repeated examination failed to detect filaria embryos. The skin and subcutaneous connective tissue of the right leg were much thickened and felt as if there were bands of dense connective tissue beneath the surface. There was no œdema nor dilatation of the cutaneous veins. The left leg was normal. One of the larger blisters was opened and in the course of ten hours it gave forth about three hundred cubic centimetres of a milky liquid that resembled lymph or chyle, containing fat, sugar, and red and white blood cells, and coagulating upon boiling. Exercise increased the swelling, rest diminished it markedly. Treatment was without effect. The case belongs to those that have been described under the names of lymphangiectasia or elephantiasis lymphangiectatica; and the blisters represent the dilated lymph-vessels of the papillæ of the skin, and are lined with endothelium. The presence of chyle in these dilated vessels can be explained by the connection that exists between the lymph-channels of the pelvis with the receptaculum chyli. Haferkorn now tabulates forty-seven cases, from a study of which he draws the following conclusions. The disease appears most frequently in the young, and indifferently in either sex. The earliest symptoms are the exudation from the external genitalia or the skin of the thigh of a clear or milky liquid, and a gradual or sudden enlargement of the lower limbs or external genitalia, the latter being sometimes accompanied with symptoms of inflammation. This exudate usually flows from minute blister-like elevations of the skin. The skin feels firmer and slightly elastic,

and usually the right side is alone involved. There is no sharp boundary between simple lymphangiectasia and lymphangiectatic elephantiasis. The general health of the patient is very rarely affected, the course of the disease is almost invariably chronic, and the only serious complication is occasional peritonitis. The causes of the condition are: 1, occlusion of the lymph-channels; 2, local disturbances of the tissues, general disturbances having only a predisposing influence. Haferkorn himself believes that the most important cause is congenital dilatation of the lymph-spaces, especially as Bayer has shown that the anastomoses of the lymph-channels are very free, and therefore that any obstruction must be very extensive. In support of this view he urges the commencement of the disease in youth, and the fact that the tissues most affected are those which from their delicate nature would be most likely to be the seat of this change, such as the scrotum, labia, and the skin of the inner side of the thigh. In conclusion, he draws attention to the similarity of his case to the cases of colpo-hyperplasia cystica, and makes a final definite diagnosis of lymphangiectasia of the vagina and possibly of the bladder and rectum.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D.,

AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the University of Pennsylvania,

Medical Superintendent of the Presbyterian Hospital.

Diagnosis of Carcinoma of the Breast in its Early Stages. (*British Medical Journal*, May 30, 1896.) By A. Marmaduke Shield, M.D.

In a clinical lecture at St. George's Hospital, the author goes over this subject very carefully and clearly. The question involved in the accurate diagnosis of this condition is such an important one that a careful study of the symptoms as observed in the large experience of Shield is valuable.

He states that out of seven hundred and fifty cases of breast-diseases of all kinds at St. George's Hospital, between the years 1875 and 1895, three hundred and fifty-three or about one-half were carcinomatous.

In making the examination he advises that the thorax be completely undressed. The examination should be made with the flat of the fingers, and not by roughly pinching up a portion of the gland. The following points are to be noted. 1. The age: the most likely age is between forty and fifty-five. 2. The character of the pain, which is neuralgic, not throbbing, and is not accompanied by heat or redness. 3. The onset is insidious. 4. The contour is rarely globular, usually it is obtuse or irregular. 5. The

hardness is stony, and is one of the most striking and reliable characteristics of scirrhus. 6. The growth does not move *in* the breast substance, but moves *with* it. 7. Retraction of the nipple is an important symptom, but it may be absent. 8. The dimpling of and the pig-skin-like condition of the skin are of the utmost value. 9. The presence of enlarged glands is important, but their absence is not proof that the disease is innocent. In cases of doubt the author is strongly in favor of exploratory incision. He believes that there are peculiarities of structure or of growth in certain individuals which may be sufficiently pronounced to become hereditary, and thus a predisposition to carcinoma may be found in some families. He calls attention to the fact that certain obscure conditions coming on in elderly women, such as an insidious pleurisy, hydrothorax, supposed "rheumatic" pains about the thorax or bones, or, of still greater importance, spontaneous fracture, or severe pains in the spine terminating in paraplegia, may be due to cancer, and that in all such cases the breast should be carefully examined, as the discovery of a scirrhus nodule may explain a very mysterious illness.

He insists upon a careful examination of the breast, lungs, and abdomen, especially of the liver, for secondary growths, as having important bearings on the question of operation.

A New Method of Operating for Hydrocele. (*Lancet*, June 13, 1896.) By Surgeon-Lieutenant-Colonel E. Lawrie, M.B. (Edin.), Residency Surgeon, Hyderabad, Deccan.

The operation for the radical cure of hydrocele should be performed in the following manner: The sac is punctured in the usual way, and when about a third or one-half of the fluid has been withdrawn, two drachms of a saturated solution of bichloride of mercury in glycerin are injected and mixed with that which remains, and allowed to rest in the sac for from half a minute to a minute. The whole of the fluid is then drawn off to the last drop. Very little pain is experienced, and unless the patient is nervous and takes an anæsthetic he is able to move about immediately after the operation. For the next few days he must, as a rule, lie about, but need not in any case be confined to bed, and in a week or less he is quite well. Provided the surgeon is careful that his hands and instruments are clean and free from micrococci when the puncture and injection are made, they produce a uniform result,—*i.e.*, sufficient aseptic inflammation to obliterate the sac and nothing more.

NEUROLOGY.

IN CHARGE OF LONDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
New York City,

WM. G. SPILLER, M.D.,
Philadelphia.

Acute Inflammatory Forms of Bulbar Paralysis. (Verein für Psychiatrie und Neurologie in Wien, *Wiener klinische Wochenschrift*, April 9, 1896.) By H. Schlesinger, M.D.

Dr. Schlesinger reported the case of a woman who, on waking one morning, found that she spoke peculiarly and that fluids regurgitated through the nose in swallowing; the evening previous she had had no symptoms. Syphilis was denied. The same day chills and vomiting occurred; high fever lasted three days. The patient suffered from vertigo, and during eight days from an irresistible desire to sleep. Some months later weakness and uncertainty of movement were noticed in the right arm, and after a time she was scarcely able to walk. Temporary diplopia and vesical trouble had also been noted. The patient became very excitable, had headache, globus hystericus, and nystagmus-like movements on looking to one side, bilateral paralysis of the soft palate, nasal speech, loss of the pharyngeal reflex, moderate degree of salivation, increased frequency of the pulse-beat and of respiration, paresis of the sensory branches of the right fifth, impairment of the senses of smell and taste on the right side, limitation of the fields of vision, light paresis of the right arm and of both lower extremities without atrophy, increased tendon reflexes, foot clonus, moderate diminution of sensibility in all its forms on the right side of the body and lower half of left leg and spastic-paretic gait. The vocal cords functionated in respiration and phonation.

Dr. Schlesinger expressed the opinion that the different forms of acute inflammation in the central nervous system cannot be clearly separated, and that the different symptoms are often merely due to difference of location. He considered the above case as possibly disseminated sclerosis with hysteria. This may begin in acute inflammatory affections of the nervous system (Oppenheim), although rarely with bulbar symptoms. It may have been originally disseminated myelitis, from which disseminated sclerosis is known to develop (Oppenheim).

Acute Hemiatrophy of the Tongue. (Verein für Psychiatrie und Neurologie in Wien, *Wiener klinische Wochenschrift*, April 9, 1896.) By Dr. Karplus.

Dr. Karplus presented a case of acute hemiatrophy of the tongue. Certain indications of hereditary syphilis were present. The patient had suffered for three nights from severe headache and pain behind the left ear, which gave place to temporary disturbance of speech, difficulty in mastication.

tion, and permanent paræsthesia on the left side of the tongue. The tongue deviated to the left in extension, and presented atrophy, fibrillary contractions, and partial reaction of degeneration. All other cerebral nerves were normal. Taste and objective sensation in the tongue were not affected. The cause may have been compression of the hypoglossal nerve in the anterior condyloid foramen from syphilitic swelling of the periosteum.

A Case of Progressive Muscular Dystrophy considerably improved by Methodic Gymnastics. (*Neurologisches Centralblatt*, May 1, 1896.) By A. Wiener, M.D. (clinic of Professor B. Sachs).

The patient had been under observation for two years. The diagnosis of the Landouzy-Dejerine type of muscular dystrophy was made on account of the extensive atrophy involving the muscles of the face and shoulders, as well as those of the back and legs; on account of the absence of fibrillary contractions; of the slight changes in the electrical reactions; of the absence of sensory disturbances, and especially on account of the progressive character of the atrophy during several years.

Electricity failed to benefit the patient. Within two months after systematic gymnastics had been employed, marked improvement was noticed, which continued under this treatment. As the muscles of the face were not exercised to any extent, the atrophy in these remained unchanged.

A Case of Ménière's Disease in Leukæmia. (*Berliner klinische Wochenschrift*, April 23, 1896.) By F. Alt, M.D., and F. Pineles, M.D.

After having complained of headache and weakness for several months, the patient was seized with an attack of violent vertigo and tinnitus aurium. Upon recovering consciousness he found that his hearing was very defective; fourteen days later deafness was complete. He now had repeated attacks of vertigo and was confined to his bed. A severe form of leukæmia myeloidalis chronica was diagnosed (2,600,000 red blood-corpuscles to 600,050 white blood-corpuscles, or about 1 : 4, numerous large mononucleated leucocytes, myelocytes, lymphocytes, scattered nucleated red blood-corpuscles, very large spleen and liver).

The microscopic examination revealed in the intramedullary portion of the cochlear and vestibular nerves numerous foci of small-cell infiltration, especially noticeable at the point of junction of the two nerves. The pia was moderately thickened and infiltrated. A moderate degeneration could be seen in the acoustic fibres. The middle ear and labyrinth were apparently normal, although it is possible that some changes in the inner ear may have escaped detection on account of the process of decalcification.

A Case of Retrograde Degeneration of the Pyramidal Fibres in the Anterior and Lateral Columns. (*Archives de Physiologie*, No. 1, January, 1896.) By Professor Dejerine and Dr. Sottas.

The patient had had spinal syphilis for thirty-two years. At the autopsy the brain was found normal, and by the microscopic examination

the ordinary lesions of syphilitic meningo-myelitis were observed. At one period in the early history of the disease it is stated that an attack of weakness of the lower limbs with retention of urine followed by incontinence developed abruptly. [The authors have elsewhere expressed their belief in the frequency of these sudden attacks of paralysis in spinal syphilis.]

The interest of the case centres in the retrograde degeneration of both direct and of both crossed pyramidal tracts. Some have considered this as a propagation of inflammation from the pia, others have explained it as an ascending myelitis. Drs. Dejerine and Sottas cannot accept the explanations above offered; they state that it only appears in cases of long duration, and involves especially the pyramidal fibres, decreasing in intensity in ascending. They consider it a cellulipetal degeneration of the motor tracts including the Wallerian degeneration of a certain number of column-fibres.

The Nerves of Taste. (Vienna Physiological Club, *Wiener klinische Wochenschrift*, May 7, 1896.) By L. von Frankl-Hochwart, M.D.

The lingual nerve supplies fibres for the sense of taste to the anterior two-thirds of the tongue; these pass entirely or for the greater part into the chorda tympani. Clinical observation of processes situated at the base of the brain proves that these fibres enter the fifth nerve; resection of the Gasserian ganglion very often causes ageusia in the anterior portion of the tongue. It is not known whether these fibres of taste are to be found in the second or third branch of the fifth nerve, and the mode of connection with the facial and chorda tympani is unknown. The glossopharyngeus is generally recognized as the nerve of taste to the posterior third of the tongue. In some individuals, however, total destruction of the trigeminal nerve by basal growths, trauma, or resection, does not interfere with the sense of taste, and probably the glossopharyngeus supplies in these cases the entire tongue with taste fibres. Although repeated clinical observation of cases in which the ninth nerve was destroyed has shown alteration of taste only at the posterior part of the tongue, Popl, in his case of compression of the left glossopharyngeus by an aneurism, as demonstrated by the autopsy, without involvement of the fifth, was able to observe considerable disturbance of taste in the anterior part of the tongue as well as total ageusia over the left posterior portion.

Aneurism of the Left Internal Carotid (or of a Branch on the Left Side from the Circle of Willis). (Berlin Medical Society, *Berliner klinische Wochenschrift*, May 4, 1896.) By Professor H. Oppenheim.

Professor Oppenheim presented a patient who had complained for fifteen years of headache, most severe over the left eye, nausea, and vomiting. In 1884 homonymous hemianopsia bilateralis dextra was noticed, and in 1888 optic neuritis. On account of the long duration an exostosis or cholesteatoma or psammoma, etc., was thought of, but an aneurism of one of the

basal arteries seemed most probable. On auscultating above the left ear a loud rhythmical murmur isochronous with the pulse was heard. With the exception of a slight paresis of the right facial, no other cranial nerves were involved. At one time the patient was said to have had diplopia. A very slight hemiparesis was present. Compression of the carotid caused no difference in the murmur.

Analgesia of the Ulnar (Biernacki) and of the Peroneal Nerve as a Sign of Tabes. (*Neurologisches Centralblatt*, April 15, 1896.) By Arthur Sarbó, M.D.

Anæsthesia of the ulnar nerve on pressure in the sulcus ulnaris was mentioned as a sign of tabes by Biernacki in 1894. It was found frequently in general paralysis (Cramer), more especially in males (Göbel), and to some extent in other mental diseases. Sarbó has found that in normal persons, or those afflicted with such nervous diseases as hemiplegia, disseminated sclerosis, lateral sclerosis, syringomyelia, hysteria, etc., pressure over the ulnar or peroneal nerve behind the head of the fibula always causes a sensation of pain. He examined fifteen cases of tabes, and observed that six of these presented bilateral ulnar and peroneal analgesia; in eleven he found bilateral analgesia of the ulnar; in six, bilateral analgesia of the peroneal nerve, and in five cases unilateral analgesia,—thus making eleven cases with involvement of the peroneal. In only one of these fifteen patients were the ulnar and peroneal nerves normal. In males the sign was more evident. These investigations were made in the presence of others, and repeated after several weeks with the same results.

A Case of Right-Sided Paralysis of the Hypoglossus. (*Neurologisches Centralblatt*, April 15, 1896.) By A. Marina, M.D.

The author describes a case of right-sided paralysis of the tongue with hemiatrophy, reaction of degeneration, contracture, and bilateral fibrillary contractions. Sensation and taste were normal. The soft palate was thinner on the same side. A pharyngeal affection had occurred before the beginning of the paralysis, and the cause of the latter may thus have been an infectious neuritis. Contracture has not previously been recorded in peripheral glossoplegia.

Muscular Flaccidity (Hypotonia) in Tabes Dorsalis. (*Neurologisches Centralblatt*, April 15, 1896.) By Dr. Fränkel.

If the lower limb of a tabetic patient is flexed, without bending it at the knee, it can be carried farther forward without pain than in a healthy person. This is due to the great flaccidity of the muscles in tabes. The writer observed the same condition in a case of infantile spinal paralysis with atrophy of the thigh, but the movement was passive. In tabes the patient himself can overflex his thigh.

This peculiarity was also noticed in the cadaver before rigor mortis set

in, and dissection showed that the muscles had not been torn. The hypotonia is not limited to the flexor muscles of the thigh; it is seen also in the gait. This abnormal degree of voluntary flexion, with preservation of the motor power and muscular volume, could be found in no other disease of the nervous system, and Fränkel considers it pathognomonic of tabes. In severe forms of tabes it never fails. A constant relation between ataxia and hypotonia does not seem to exist. Ataxia is a symptom-complex made of elements of different significance.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

A Case of Indigenous Parasitic Chyluria with *Filaria Nocturna* in the Blood. (*Medical News*, May 2, 1896.) By Frederick P. Henry, M.D.

The writer considers the following case of chyluria as of special interest, both because it is the first of the kind observed in Philadelphia, and also for the reason that it adds another to the list of those indigenous to the United States.

Fanny B., aged twenty-nine, was born in Columbia, South Carolina, where she lived until she was twenty-seven years of age. She then spent one year in Palatka, Florida, and came to Philadelphia in March, 1895.

At the age of twelve, after a fall from a tree, an abscess developed in the left lumbar region and remained open for several months. A year after its closure another appeared in the left iliac region which also pursued a chronic course. These abscesses may have been due to filariæ, as they form part of the clinical history of filariasis.

The patient had two miscarriages, one at four months and a half and the other at two months, which were ascribed to persistent vomiting. She gave birth to a child at term three weeks before her admission to the Woman's Hospital of Philadelphia, on February 16, 1896. The labor was normal, but she suffered previously with pain in the region of the kidneys which returned on the second day of her lying-in, and continued for a week, when it abated somewhat. This was followed by difficulty in micturition from occlusion of the urethra by coagula of lymph and blood, and the urine became milky and separated on standing into two portions, the lower being hemorrhagic and the upper having the appearance of milk or cream. This chylous urine contained fat and a trace of albumin, but no sugar nor casts.

A microscopical examination of the blood drawn from the finger was made at 10 P.M., on February 19, and filariæ were found in almost every slide. Subsequent observations showed that the parasites were very few in number or absent from the blood during the day; they were, therefore, the variety known as the *filaria nocturna*.

The patient was put to bed and treated first with quinine and ergotin, but without any apparent effect. On February 28 she was placed upon thymol (two grains every three hours). The urine then became normal in every respect, and remained so for seven days, when it again became chylous and bloody. The filariæ during this interval were present in the blood. On March 12 methylene blue in two-grain capsules every three hours was ordered, the writer being induced to do so by the statements of Dr. Austin Flint, concerning the efficacy of this substance in a case of parasitic chyluria. After being taken continuously for seventy-two hours the blood was found to contain actively-moving unstained filariæ. The urine and fæces were stained a deep blue, the milk was uncolored. After being taken for nine days the drug proved absolutely inert so far as any influence on the vitality of the embryos is concerned, and it does not stain them until they are dead.

The patient was vaccinated in accordance with the theory that an intercurrent affection might destroy the parasite, but although successful it was quite useless from a therapeutic stand-point.

In regard to treatment the writer does not believe that there is a drug capable of destroying adult filariæ in the human system.

Leeches were applied to the patient to find whether they play the rôle of intermediate host to the filariæ. The parasites lived many hours in the body of the leech, but finally died.

The writer questions whether filariasis may not become endemic in Philadelphia by the importation of a case into the city. Dr. Patrick Manson has established the fact that the mosquito acts as an intermediary host in conveying the *filaria nocturna* from man to man. Mosquitoes are very abundant in Philadelphia, and have access to its water-supply, the Schuylkill River. The only protection from this and other sources of infection is filtration.

Primary Splenomegaly,—Primary Carcinoma of the Spleen. (*Archives de Médecine expérimentale et d'Anatomie pathologique*, March, 1896.) By Drs. Picon and Ramond.

The authors record a case of this condition which had previously been described by Gaucher in 1882. The disease has a definite clinical type, regular and uniform increase in the size of the spleen and of the liver without any ascites. Pain increasing with the progress of the disease. Interference with digestion, defecation, and micturition from pressure exerted by the spleen, epistaxis and general hemorrhages, spongy gums, icterus, diarrhoea, no glandular enlargement, oligocythæmia without leuco-

cytosis. The disease lasts for a long time, and death is usually due to some complication. The spleen retains its ordinary form, but is much heavier than normal; its tissue is sclerosed and infarcts are present. The liver shows diffuse interstitial cirrhosis, peri- and intralobular. Microscopically the spleen is occupied by alveoli of fibrous tissue containing large epithelial-looking cells, polyhedral, measuring 16 by 36 microns, with nuclei 4 by 8 microns. These cells may be separated by hemorrhages. The Malpighian bodies are destroyed by the growth, and the vessels narrowed and sclerosed.

The case they record was a woman, aged thirty-two years, who had never had ague, but since a blow on the abdomen four years before had suffered from abdominal pain. Her gums became painful, and her legs œdematous. She was very anæmic from menorrhagia, and of an icteric tint. There was a large abdominal tumor, which was thought to be a uterine myoma. Laparotomy was performed, and the tumor, which was then for the first time recognized as the spleen, was removed successfully. The liver at the time of the operation appeared normal, but subsequently became enlarged. The blood was not examined before the operation, but after it only showed a moderate degree of traumatic anæmia. Cultures from the spleen were negative. It weighed two thousand eight hundred grammes, and histologically presented most of the appearances described by Gaucher, but showed certain differences; thus, the alveolar walls contained pigment, some of the epithelial cells had undergone pigmentary degeneration, giant-cells were present, the Malpighian bodies were preserved, and the lymphatic glands in the hilum of the organ were involved in a similar manner, and probably secondarily to the spleen. The nature of the change in the spleen is discussed at some length. Gaucher regarded his case as carcinoma, but Cornil did not admit the possibility of primary carcinoma of the spleen, and regarded the changes merely as those of hyperplasia.

The authors did not consider it to be an endothelioma, because, except for some sclerosis, the vessels showed no change. They came to the conclusion that it was a primary carcinoma of the spleen, giving rise to secondary growths in the adjacent lymphatic glands, and believed that it arose in some fragments of the pancreas which in foetal life had been included in the substance of the spleen. Such an inclusion they found in a three months' foetus, and identified as of this nature the cells described by Peremeschko in the spleens of fetuses, young children, and suckling women.

In discussing this paper the abstracter, Rolleston, says that the description of the clinical history and morbid anatomy does not convey the impression that the disease is carcinoma, or, indeed, any new growth in the ordinary sense of the term. As it is a very rare condition, attention may be drawn to "a case of enlarged spleen in a child, aged six years," brought before the Pathological Society of London (*Trans. Path. Soc.*, vol. xlv. p. 148) by Dr. W. Collier, which is almost identical with that of Picon and

Ramond. The microscopic appearances were so remarkable that it was referred to the Morbid Growths Committee. Their report, however, is somewhat indefinite. They do not regard the condition as sarcomatous or lymphadenomatous, and consider the large number of endothelial-like cells as similar to that "not uncommon in lymphatic glands." This appearance is probably the large-celled hyperplasia figured by Ziegler (Macalister's translation, Part II., s. 3, p. 112, 1884), and which is also met with sometimes in tuberculosis of lymphatic glands.—*Medical Chronicle*, June, 1896.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

LEGAL RESPONSIBILITY OF A PHYSICIAN FOR THE NEGLIGENCE OF HIS PROFESSIONAL SUBSTITUTE.

IT is customary for the physician, when temporarily absent from his practice, to intrust it to another physician; and, in the recent case of *Blank vs. Hathorn*,¹ which arose in New Jersey, the duties and liabilities of the principal and his professional substitute were ascertained and defined.

The action was brought on the theory that the substitute was the agent of the absent physician, who, as a consequence, is liable for the results of the negligence or unskilfulness of such substitute. The trial court adopted this view; but the Court of Appeals, to which the case was carried by the absent physician against whom a verdict was obtained, declared this to be error, holding that each physician was engaged in a distinct and independent occupation of his own, having no business connection with the other except such as might incidentally arise from the one attending the patient of the other while he was temporarily absent; and that in such case the regular physician is not liable for the want of skill in his professional substitute.

The principal facts which were proved at the trial of the cause are as follows: The defendant, a practising physician of the city of M., promised the plaintiff, who resided in that city, to attend his wife professionally during her confinement. A short time before that event took place he left the city for a three days' vacation; having first visited the wife of the plaintiff, and made an examination of her condition, from which he concluded, as he informed her, that his services would not be needed for a few days. Before his return, however, she was confined. The plaintiff, when his wife's travail came on, telephoned to the house of the defendant for him

¹ 33 Atl. Rep. 389.

to come at once; and in response to this message one Doctor P. arrived, stating that Doctor B. was out of town, and he represented him, and proceeded to take charge of the case, and to deliver the plaintiff's wife of her child, without any objection being made. It was not suggested that his treatment of the wife was unskilful, but evidence was offered to show that after the birth of the child he improperly severed the umbilical cord so close to its body that it was impossible afterwards to tie it, and that the child consequently died, in a short time, of umbilical hemorrhage. The shock caused by the child's death under these circumstances, it was testified, so affected the mother as to seriously injure her health, and render her an invalid for many months, thereby depriving the plaintiff of her services and companionship, and making it necessary for him to incur expenses which he would not otherwise have been called upon to meet; and this suit was brought to recover compensation for such loss of services and companionship, and for such expenses, on the theory that Doctor P. was the agent and representative in this matter of the defendant, and that, therefore, he was legally liable for these results of Doctor P.'s unskilfulness. The trial judge adopted this theory, advanced on behalf of the plaintiff, in his charge to the jury, and so instructed them. "In this," says the Supreme Court, in an opinion by Gummere, J., "there was an error. Doctor P. and the defendant were each of them practising physicians of this State, having no business connection with one another, except that Doctor P. was attending the patient of the latter while he was temporarily absent. Even if it be admitted, therefore, that Doctor P. was employed by the defendant to attend upon the wife of the plaintiff, that fact did not render the defendant liable for his neglect or want of skill in the performance of this service, for an examination of the authorities will show that a party employing a person who follows a distinct and independent occupation of his own is not responsible for the negligence or improper acts of the other.

"But," continues the judge, "even if I had reached the conclusion that Doctor P. was the agent of the defendant, in his attendance upon the wife of the plaintiff, I should nevertheless consider that there could be no recovery in this case for the losses sustained by the plaintiff. He does not complain that his wife was unskilfully treated by Doctor P., and that he thereby lost her services and companionship, and incurred expenses on that account to which he would not otherwise have been put. His claim is that such unskilfulness caused the death of his child, and that the shock of its death caused the sickness of the mother, with the consequent deprivation of her services and society, and the increase of his expenses. The gravamen of the action, it will be perceived, is the death of the child; and the injury sustained by the father, for which damages are sought to be recovered, is the result of that death. Since the decision of the Supreme Court in the case of *Grasso vs. Railroad Co.*,¹ it has been considered as

¹ 50 N. J. Law, 317.

settled law in this State that no action will lie for an injury caused by the death of a human being, with the exception of that provided by the Act of March 3, 1848,¹ which permits a recovery by the personal representatives of the decedent, for the benefit of the widow and next of kin, of the pecuniary loss resulting to them from such death. The decision in that case was rendered after a careful and exhaustive consideration, and the views expressed by Magie, J., in delivering the opinion of the court, must be accepted as a correct exposition of the law on the subject. The judgment of the Circuit Court should be reversed."

It must be borne in mind, however, that the doctrine of agency applies in the case of a medical student. And, accordingly, the preceptor is liable in damages to a patient for unskilful treatment by his student whom he has sent to attend such patient professionally.

BOOK REVIEWS.

THE METHODICAL EXAMINATION OF THE EYE, BEING PART I. OF A GUIDE TO THE PRACTICE OF OPHTHALMOLOGY FOR STUDENTS AND PRACTITIONERS. By William Lang, F.R.C.S. (Eng.), Surgeon to the Royal London Ophthalmic Hospital, Moorfields; Surgeon to, and Lecturer on Ophthalmology at, the Middlesex Hospital. Longmans, Green & Co., London and New York, 1895. Small 8vo, pp. 96.

Careful perusal of this little work will show any one how necessary a detailed examination of any case of ocular disease becomes, if the examiner desires to practically obtain a proper diagnosis from the existent conditions. It brings prominently into view the greatest of truths in ophthalmology, that the two necessary requisites for the success in this the most exact of the arts of medicine are to work methodically, and not to take anything for granted. In bringing these two factors constantly before the reader, the author has achieved a purpose that has been rarely obtained by other writers upon the same subject.

The natural order of sequence of examination has been properly divided into three stages: the study of the ocular appendages and the anterior portions of the eye; the examination of the vision and refraction; and, lastly, the investigation of the interior part of the eye by the aid of the ophthalmoscope. Critical study of the various plans proposed shows that the author, after a full and rich experience, has offered only those methods that have had the sanction of the best of practical clinicians and have withstood the test of time.

The presentation of the subject-matter itself has been made in a language that is free from all technicality. The words are well chosen, the sentences are crisp and easily understood, and each paragraph contains just sufficient material to concisely yet fully explain the particular portion of the subject under consideration: in fact, the uninformed student who desires to practically acquire and to thoroughly appreciate the best and the most useful of the routine methods of examination of eye-disease, can do no better in such pursuits than to use this little hand-book as a constant guide: as such, the reviewer unhesitatingly recommends it. C. A. O.

¹ N. J. Revision, 294.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

AUGUST, 1896.

[No. 7.]

ORIGINAL COMMUNICATIONS.

*THE IMPORTANCE OF THE SALIVA IN GASTRIC DIGESTION.**

BY JULIUS FRIEDENWALD, A.B., M.D.,

Clinical Professor of Diseases of the Stomach, College of Physicians and Surgeons, Baltimore; Visiting Physician, Bay View Hospital; Physician in the Medical Department of the City Hospital Dispensary.

It has long been known that the saliva plays an important part in gastric digestion, and that dyspeptic symptoms are apt to occur when the saliva is not swallowed. Thus, Wright,¹ in 1844, lost eleven pounds in weight while collecting two hundred and fifty drachms of saliva in one week. He considered the saliva to possess a stimulating influence on the stomach, and that this influence was specific. He based this upon the following experiment: The œsophagus of a dog was ligated, thus preventing any saliva from reaching the stomach, and a fistulous opening was made through which food was passed into the stomach. Meat thus introduced was poorly digested. When the œsophagus was unobstructed the meat was well digested.

Bidder and Schmidt,² in their classical experiments on digestion, found that ligation of the salivary ducts resulted in marked lowering of the acidity of the gastric contents of dogs.

Similar conclusions have been reached from clinical experience. Bursarius restored a patient, who was greatly emaciated, to complete health by having him swallow his saliva.

The explanation of these phenomena seemed to depend upon the fact

* From the Department of Clinical Medicine, College of Physicians and Surgeons, Baltimore.

(discovered by Leuchs³ in 1831) that saliva converted starch into sugar. It was claimed that the absence of amylolysis was itself sufficient to produce serious gastric derangement. These conclusions were, however, discredited by the work of Müller, Schwann, Beaumont, Purkinje, Vogel, and especially Claude-Bernard.⁴ These investigators showed that the action of the saliva is immediately checked by the acid of the gastric juice; that its amylolytic action must be very slight, and, therefore, concluded that the saliva serves no other function than of assisting in deglutition and of moistening the food.

Schiff⁵ believed that the saliva acts as a solvent of "peptogene," aiding in the liberation of pepsin.

Frerichs,⁶ in his studies on the saliva, found that the amylolytic action of this secretion was very marked. He also noted that dyspeptic symptoms were produced when he had collected large quantities of his saliva for experimental purposes; he claimed that the saliva had a specific influence upon gastric secretion.

R. von den Velden,⁷ who investigated this subject, still further showed that the diastatic action of ptyalin is lessened in the stomach in proportion to the degree of acidity. Inasmuch as the acidity is least marked at the beginning of gastric digestion, the conclusion was reached that the saliva retains its amylolytic action during the first stage of gastric digestion. He, therefore, divided gastric digestion into two stages: the first embraces that period in which free HCl is absent, and the saliva swallowed with the food still acts upon the starches; in the second, when free HCl is present, the ptyalin is no longer active.

The action of the diastatic ferment during gastric digestion was further investigated by Ellenberger and Hofmeister⁸ upon the horse, and by Ewald and Boas⁹ upon the human being; we, therefore, know that the saliva converts starches into dextrine and maltose in the stomach until the presence of free HCl puts an end to the process.

George Sticker¹⁰ attempted to show that saliva exerted still another influence upon gastric digestion, and that this was of such a nature that an absence of salivary secretion not only resulted in an absence of amylolysis, but that the proteolysis was much retarded. He reported a case of a woman, sixty-two years of age, who had been suffering for half a year with great thirst and dryness of the mouth, and with marked indigestion, pressure in the stomach after meals, eructations, constipation, etc. Five hours after a Riegel's test-dinner the gastric contents were examined and showed marked retardation of the secretory function of the stomach, both as to hydrochloric acid and pepsin. After the use of jaborandi the salivary secretion was restored and the gastric disturbance entirely disappeared. He investigated the matter further by the following experiment: A test-breakfast was introduced into the stomach through a stomach-tube and care was taken to avoid swallowing any saliva. After two hours the stomach was found to contain large quantities, which gave a more marked iodine reaction,

showed less acidity and much less peptic strength than if the patient ate the breakfast and was allowed to swallow his saliva.

A. Schuld¹¹ studied the influence of the saliva upon the hydrochloric acid of the gastric juice upon himself and a patient with fully normal digestive powers. The test-meal was expressed at intervals of fifty, sixty, or seventy minutes. It consisted of zwiebach and tea or egg albumen with two-per-cent. starch solution. The determination of hydrochloric acid was made according to Leo's method. Schuld believes that the beneficial influence of saliva is due not to a specific influence of the saliva, but to a reflex influence produced by chewing and to the food remaining in the mouth, whereby its alkalinity or its acid reaction is weakened.

The experiments of Sticker were too few for definite conclusions, and E. Biernacki¹² (working in Riegel's clinic) continued the study of this subject. He utilized a test-breakfast consisting of from one hundred to two hundred cubic centimetres of a four-per-cent. solution of starch (*i.e.*, four to eight grammes of starch in one hundred and fifty to two hundred cubic centimetres of water), with twenty cubic centimetres of the white of raw egg, the total quantity of fluid being two hundred and seventy cubic centimetres.

The breakfast was removed one hour after ingestion. Other test-breakfasts, such as the white of the egg with sugar and water, or white of the egg with water or milk, were given as control experiments. The patient, while in a fasting condition, had his stomach washed out and then had the starch breakfast introduced through the tube, no saliva being swallowed for thirty minutes; at the end of this time the gastric contents were removed, the stomach again washed, and the patient allowed to swallow slowly the same quantity of the starch breakfast. The contents were again removed after thirty minutes, during which time the saliva was swallowed. In a number of experiments on normal persons he found that both the motor and secretory functions of the stomach are much better when the saliva is allowed to act. When the breakfast was swallowed together with the saliva the contents expressed were much less in quantity, usually about half, and these had a greater total acidity and more hydrochloric acid than in the first set of experiments. No marked differences were found in regard to the secretion of the pepsin ferment.

Under pathological conditions of the stomach the same results were usually obtained; sometimes, however, the gastric contents showed no difference whether the saliva was swallowed or not, and in rare cases the reverse resulted,—that is, the digestion was better when the food was introduced through the stomach-tube without saliva.

What was most remarkable, however, in these conditions of gastric disturbance were the great variations in the pepsin-digestion power, which was found much more active when the saliva had been swallowed with the breakfast.

Biernacki investigated this matter further in order to get an insight into

the causes of these variations. Quantities of saliva were added to the breakfast introduced through the tube in order to determine whether any beneficial effect was thus excited by the saliva. No effect was noted; the acidity and pepsin digestion were quite as low as in the control experiment, in which a breakfast alone was introduced through the tube.

In a further set of experiments a breakfast was masticated and then passed into the stomach through the stomach-tube, no saliva entering thereafter. The result was very striking, less gastric contents were obtained, and these were much richer in hydrochloric acid and of greater peptic power than in the control experiments without saliva. From this Biernacki concluded that the beneficial effect of the saliva is produced during the passage of the food through the mouth, and that the saliva swallowed after the passage of the food into the stomach has less influence.

In another series of experiments the saliva was heated to 85° C. for five minutes for the purpose of destroying the ptyalin, and yet the same beneficial action upon the digestion in the stomach was obtained. The ptyalin itself, therefore, is not sufficient to account for the beneficial action of the saliva in gastric digestion. That the production of dextrine is of no importance is shown by the fact that results are exactly the same when obtained with a breakfast of pure egg albumen.

A negative result was also obtained when KSCN was introduced through the stomach-tubes, saliva not being allowed to enter the stomach, thus excluding this ingredient of the saliva.

Biernacki thus comes to the conclusion that the beneficial effect of the saliva must be due to its alkalinity, and, further, that the starchy alkaline breakfast is converted into a less alkaline medium by the action of the saliva. He bases these conclusions upon the fact that if a small quantity of water be made slightly alkaline with a decinormal sodium hydrate solution and a red color produced by the addition of a few drops of phenolphthalein as indicator, the solution when shaken up in the mouth for a few minutes loses its color entirely. Working upon this theory (which I shall show to be erroneous), he attempts to demonstrate that, inasmuch as a neutral or slightly acid breakfast serves best to stimulate the process of gastric digestion, the beneficial effect of the saliva upon the gastric digestion is caused almost entirely by a change of reaction, the reaction becoming less alkaline, neutral, or slightly acid. The saliva would, therefore, have no specific action upon gastric digestion. The conclusions reached by Biernacki were so remarkable that it appeared to me that the subject demanded further investigation. In my investigations Biernacki's experiments were repeated. Breakfasts were utilized, consisting of white of egg and starch solution, egg and water, egg and water and sugar, in all cases an amount equal to two hundred and seventy cubic centimetres. The starch solution consisted of one hundred to two hundred cubic centimetres of a four-per-cent. solution of starch,—that is, four to eight grammes of starch boiled with one hundred and fifty to two hundred and fifty cubic centimetres of water and

twenty cubic centimetres of raw egg albumen then added. In the first series of experiments the breakfast was introduced through the stomach-tube after previous lavage. During the following half-hour the saliva was collected in a cup, and at the end of this time the gastric contents were expressed. The patient was now allowed to rest for fifteen minutes.

The stomach was then again washed out and the same quantity of a similar breakfast was swallowed, this time with the saliva. After one-half hour the gastric contents were removed and compared with those obtained in the previous experiment.

As daily variations in the motor and secretory functions of the stomach occur, the two experiments were made on the same day.

When milk was used as a test-breakfast it was removed at the end of an hour.

The character, quantity, and temperature of the two breakfasts were always the same in those cases in which comparisons were made. The advantage of the liquid breakfast lay in the fact that complete expression of the gastric contents may then be made; this in a measure is an index of the motor activity of the stomach.

With the starch breakfast it is easy to tell to what degree the breakfast has been acted upon by the saliva; for a blue color with Lugol's solution will show that the saliva has not come in contact with the starch. The gastric filtrate was tested with litmus, congo-paper, phloroglucin-vanillin (for free hydrochloric acid). The total acidity was estimated with one-tenth normal NaOH solution, phenolphthalein being used as indicator, and the hydrochloric acid determined by Boas's¹³ modification of the Sjöquist method.

The peptic strength was determined by making the filtrate acid, and noting the time required for five cubic centimetres of gastric filtrate at 40° C. to dissolve a plate of fibrin. The degree of rennet activity was similarly estimated by placing five cubic centimetres of milk in five cubic centimetres of gastric contents (made neutral), and noting the time of caseine coagulation at 40° C.

The experiments were made upon four persons with perfectly normal digestion. Table I. contains,—

1. Number of experiments.
2. Date of experiments.
3. Test-breakfasts utilized; E representing egg albumen (twenty cubic centimetres); 100 to 250 S represents one hundred to two hundred and fifty cubic centimetres of a four-per-cent. solution of a cooked starch paste; 4 to 10 Z represents four to ten grammes of sugar; 100 to 50 W, one hundred to fifty cubic centimeters of water.
4. Amount obtained.
5. Reaction obtained with congo-paper.
6. Reaction for free hydrochloric acid with phloroglucin-vanillin.
7. Reaction for starch with Lugol's solution.

8. Acidity as determined by means of one-tenth NaOH solution, phenolphthalein being used as indicator.

9. Hydrochloric acid as determined by Sjöquist's method.

10. Pepsin digestion.

11. Rennet digestion.

12. Whether breakfast was swallowed with or without saliva.

The gastric contents expressed were always greater in quantity in those cases in which the saliva was not swallowed than when it was; the acidity and free HCl were always greater in quantity in the second instance than in the first. This is especially apparent in experiments in Table I., T. J., 1, 3, 5; M. T., 1, 3; F. E., 1, 3, 5, 7; P. G., 1, 5, 7.

On the other hand, no especial differences were noted under normal conditions in the pepsin digestion. The rennet activity seems to be somewhat more pronounced when the saliva had mingled with the breakfast than when it had not been swallowed. The conclusions derived from these experiments coincide completely with those of Biernacki,—namely, that the motor and secretory functions of the stomach in health are markedly better when the saliva has mingled with the breakfast than when the food has been introduced through a stomach-tube and kept free from the saliva. Similar experiments were made on eight cases of gastric disturbance of various kinds; the results obtained were in general the same as those found in healthy individuals. These cases comprise Table II. The secretory and motor functions of the stomach were in most cases markedly increased when the saliva mingled with the breakfast. In rare instances these functions were not influenced by the saliva, and even frequently both the motor and secretory action were decreased by the saliva.

In one case of atony, L. P., experiments 9 and 10, with normal acidity, the motor and secretory action of the stomach were greatly increased under the influence of the saliva, while in case K. L., experiments 23, 24, 25, 26, with subacidity, the saliva exerted no influence whatever. In one case of chronic gastritis, N. H., experiments 11, 12, 13, 14, the action of the saliva in promoting the motor and secretory functions of the stomach is markedly shown, while in another case, T. F., experiments 15, 16, 17, 18, neither the motor action nor the percentage of free hydrochloric acid were altered by the saliva. In a case, pulmonary tuberculosis (B. H., experiments 27, 28, 29, 30) with secondary catarrh of the stomach, both functions seemed to be decreased by the action of the saliva. In a case of nervous dyspepsia with a subacidity (C. F., 1, 2, 3, 4), the motor as well as the secretory functions are markedly increased by the presence of the saliva; while in a case of cancer of the stomach (O. T., 19, 20, 21, 22) there was no difference.

The effect of the saliva upon the activity of the pepsin and rennet ferments is of greater significance in pathological than in normal conditions. The pepsin and rennet ferments are more active when the saliva mingles

with the food than when it does not. Thus, in case L. P., experiments 9 and 10, it required six hours for the pepsin to digest a bit of albumen when the saliva had not mingled with the breakfast, while but two and three-fourths hours were needed to complete the process when the saliva came in contact with the food.

In case N. H., 11, 12, 13, 14, chronic gastritis, four and four and one-fourth hours were necessary for fibrin digestion when the saliva had mingled with the food, and seven and five hours when it had not.

Fifty and forty-five minutes were required to coagulate milk when the saliva had not been swallowed, twenty to fifteen when it had.

In case O. T., experiments 19, 20, 21, 22, cancer of the stomach, the conditions were reversed; for, while the figures four and three and three-fourths were obtained for the pepsin in the first instance without saliva, six and four were obtained in the second instances with saliva; and while it required thirty and twenty-five minutes to coagulate the milk in the first instances, fifty minutes were needed in the second instances.

These experiments show that the results thus far obtained by Biernacki are correct,—namely, that the saliva exerts a marked influence upon gastric digestion, increasing the motor and secretory action of the stomach, and that the saliva exerts a more important influence upon the secretion of the enzymes in the stomach in pathological conditions than in health.

Inasmuch as the test-breakfast in the first set of experiments was passed in quickly through the stomach-tube, and in the second, swallowed slowly, it was necessary to determine whether the beneficial effect in those cases in which the saliva was swallowed with the food was due to the previous introduction of the stomach-tube. For this reason a number of test-breakfasts were passed in succession through the tube into the stomach. In these experiments the digestive power was less marked in the second than in the first instant. (Table III.) After emptying the stomach for the second time more contents with a lessened percentage of hydrochloric acid were obtained than at first.

In order to determine in what manner and what part of the saliva takes part in this important process, a number of other experiments were performed.

A test-breakfast similar to the one above was used. In one set of experiments it was swallowed without saliva; in a second, saliva was added in varying proportions. (See Table IV.) Both breakfasts were passed into the stomach through the tube, no saliva being swallowed until the contents had been removed from the stomach. The saliva utilized was that collected a short while before its use. No special effect of the saliva upon gastric digestion was noted; both the motor and secretory functions of the stomach remained the same, notwithstanding the saliva had been added to the breakfast and introduced into the stomach through the tube, just as in the control experiments in which no saliva had been thus added.

In one experiment, No. 12, the breakfast was passed into the stomach

through the tube; the saliva was then swallowed for half an hour. In this case far better gastric digestion was manifested than in the control experiment No. 11. These experiments, therefore, make it manifest that we cannot consider the action of the saliva as acting purely mechanically upon the stomach. In another series of experiments (Table V.) the whole trial-breakfast was slowly and carefully masticated, and passed into the stomach through the tube; the effect was the same as if it had been swallowed. In all cases less gastric contents were obtained with much greater acidity and of greater peptic and rennet power than in the control experiment. The effect of the saliva as a factor in gastric digestion is therefore exerted mainly in the passage of the food through the mouth. The saliva swallowed afterwards exerts a much feebler influence than that swallowed with the food.

It was likewise important to determine whether the act of mastication in itself did not stimulate gastric digestion.

For this purpose (1) a breakfast was swallowed through the tube, and no saliva allowed to enter the stomach. At the end of half an hour the contents were expressed. (2) A second breakfast, exactly like the first, was similarly passed through the tube into the stomach, the person constantly masticating a bit of rubber for half an hour, the saliva, however, being collected and not swallowed. The gastric digestion was just as poor in the second case as in the first. The act of mastication in itself exerts no influence whatever upon gastric digestion. (See Table VI.)

In order to determine whether the effect of the saliva upon gastric digestion is only produced in the mouth by the saliva coming there in contact with the food, a series of experiments were performed in which, after having rubbed up a test-breakfast with forty-five cubic centimetres of saliva, previously collected, the breakfast was placed into the stomach through the tube, no saliva being swallowed. (Table VII.) It is seen that under these conditions the digestion in the stomach is just as poor as when, in the control experiment, the breakfast had been introduced into the stomach-tube without any saliva.

That the beneficial effect of the saliva upon gastric digestion is not due to the ptyalin is shown by the fact that when a breakfast is completely masticated and then placed in a beaker and heated to 80° C. for five minutes, thus destroying the ptyalin,¹⁴ and then passed into the stomach, the beneficial effect is still very marked. (Table VIII.)

That the effect is not due to the change of the starch into sugar is shown by the fact that the beneficial effect of the saliva is also manifested when merely an albumin or albumin-sugar breakfast is ingested.

Biernacki has moreover shown that the change cannot be due to the sulphocyanide of potassium present in the saliva.

Biernacki attributes the salutary effect of the saliva to its alkalinity, and claims that, notwithstanding this quality, it converts the starchy alkaline breakfast into a *less alkaline* medium. He bases these conclusions on the fact that if twenty cubic centimetres of water are made alkaline with a one-

tenth normal sodium hydrate solution and a red color produced by the addition of a few drops of phenolphthalein as indicator, this solution when mixed up in the mouth for a few seconds loses its color entirely. He entirely ignores the fact that the slightest trace of carbon dioxide *will make an alkaline solution which has been previously colored by phenolphthalein colorless*. When the solution is boiled the red color immediately returns, though Biernacki makes a statement to the contrary. That the change of color of the alkaline phenolphthalein solution is merely dependent upon the presence of carbon dioxide in the solution, I have been able to show in a large number of cases. The decolorized fluid was placed in a test-tube connected with another tube containing lime-water; on boiling the solution the lime-water showed a turbidity indicating the presence of CO_2 .

To show that the alkaline saliva does not in any way lessen the alkalinity of liquids placed in the mouth the following six experiments were performed.

Fifty cubic centimetres of boiled neutral distilled water were mixed up thoroughly in the mouth for one and one-half minutes; the solution was boiled to five cubic centimetres and the alkalinity determined, a freshly prepared solution of litmus being used as indicator.

The next morning, at the same hour, the same quantity of distilled water was made slightly alkaline with one-half cubic centimetre of one-tenth normal NaOH , and also mixed thoroughly in the mouth; the alkalinity being determined as before.

Finally, on the third morning the same procedure was gone through with, with an acid solution of one-half cubic centimetre of one-tenth normal HCl . The results obtained are as would be expected. The alkalinity of the alkaline solution was either very slightly increased or the same as at first. The acidity of the acid solution was of course diminished. These experiments were made on normal individuals. (Table IX.)

That slight changes in reaction of the food greatly affect the digestion in the stomach is shown by the following experiments, in which breakfasts of twenty cubic centimetres of egg albumen together with two hundred cubic centimetres of a four-per-cent. solution of starch and fifty cubic centimetres of water were utilized; the breakfasts were passed into the stomach through the tube, no saliva being swallowed.

In Table X. it is shown that a slightly neutral or acid breakfast is more quickly digested than one markedly alkaline. What effect the saliva has in producing these changes in reaction of the food remains to be solved.

It may be possible that the carbon dioxide, which is absorbed in the mouth, exerts considerable influence in promoting gastric digestion.

This is true except in experiments Nos. 19 and 20, showing that Na_2CO_3 acts differently from other alkalies, such as NaOH . It is probable, as Biernacki points out, that, while NaOH is acted on by the HCl of the gastric juice, thus, $\text{NaOH} + \text{HCl} = \text{NaCl} + \text{H}_2\text{O}$, the more NaOH present the more HCl is destroyed. The Na_2CO_3 also neutralizes the HCl , but CO_2

is constantly formed, which stimulates the mucous membrane of the stomach. Joworski¹⁵ has also shown that CO₂ is an excellent stimulant to the gastric mucous membrane.

From these experiments it may be concluded,—

1. That the saliva exerts a marked beneficial effect upon gastric digestion in healthy as well as in pathological conditions.

2. That this effect is not due to the amylolytic action of the saliva, nor to the KSCN, nor to the presence of the ptyalin ferment. It is not due to the act of mastication.

3. The effect is produced on the food in its passage through the mouth, the saliva that is swallowed after the food is in the stomach having much less influence.

4. The reaction of the saliva exerts much influence in this respect, and it is possible that a part of the beneficial effect is obtained from the carbon dioxide swallowed.

TABLE I.—NORMAL CASES.

Name.	No.	Date.	Test-breakfast.	Amount.	Congo.	Phloroglucin-vanillin.	Iodine.	Acidity.	Per cent. of hydrochloric acid.	Pepsin, hours.	Rennet, minutes.	Remarks.
T. J.	1	July 20	1 E + 250 S	70	weak blue	no	strong	14	.04384	2½	.	without saliva
T. J.	2	July 20	1 E + 250 S	40	strong blue	reaction	none	30	.1220	2½	.	with saliva
T. J.	3	July 27	2 E + 250 W	50	not blue	no	.....	10	0.3852	2½	.	without saliva
T. J.	4	July 27	2 E + 250 W	20	blue	reaction	.....	60	0.1559	2½	.	with saliva
T. J.	5	July 30	1 E + 8 sugar + 250 W	60	weak blue	reaction	.....	22	0.0657	2½	.	without saliva
T. J.	6	July 30	.....	30	weak blue	reaction	.....	38	0.1095	2½	.	with saliva
T. J.	7	July 31	1 E + 100 S + 150 W	75	no	no	blue	12	0.0365	2½	25	without saliva
T. J.	8	July 31	.....	40	weak blue	no	no	28	0.0625	2	20	with saliva
M. T.	1	Aug. 7	1 E + 200 S + 50 H ₂ O	100	no	no	blue	24	0.0326	2	.	without saliva
M. T.	2	Aug. 7	1 E + 200 S + 50 H ₂ O	30	yes	reaction	no	62	0.1345	1½	.	with saliva
M. T.	3	Aug. 9	1 E + 100 S + 150 H ₂ O	90	no	no	blue	14	0.0318	2	35	without saliva
M. T.	4	Aug. 9	.....	30	weak blue	no	no	35	0.0972	1½	20	with saliva
F. E.	1	July 30	2 E + 250 W	60	no	no	.....	25	0.07305	2	.	without saliva
F. E.	2	July 30	2 E + 250 W	45	weak blue	reaction	blue	42	0.11795	2½	.	with saliva
F. E.	3	July 31	1 E + 100 S + 150 W	100	reaction	reaction	no	28	0.0766	2½	.	without saliva
F. E.	4	July 31	.....	35	strong	reaction	no	52	0.10585	2½	.	with saliva
F. E.	5	Aug. 12	1 E + 250 S	60	reaction	no	blue	18	0.05840	2	.	without saliva
F. E.	6	Aug. 12	.....	30	strong	reaction	no	38	0.01180	1½	.	with saliva
F. E.	7	Aug. 6	1 E + 250 W + 8 sugar	50	weak	no	.....	21	0.05716	2½	.	without saliva
F. E.	8	Aug. 6	.....	25	strong	reaction	.....	42	0.13213	2	.	with saliva
P. G.	1	Aug. 8	2 E + 250 W	65	weak blue	no	.....	17	0.03264	2	.	without saliva
P. G.	2	Aug. 8	2 E + 250 W	30	strong blue	reaction	.....	51	0.10562	2½	.	with saliva
P. G.	3	Aug. 10	1 E + 100 S + 150 W	90	no	no	strong	13	0.02011	2½	30	without saliva
P. G.	4	Aug. 10	.....	25	no	no	no	30	0.09875	2½	25	with saliva
P. G.	5	Aug. 12	1 E + 250 S	60	no	no	strong	20	0.04797	3	45	without saliva
P. G.	6	Aug. 12	.....	30	weak	no	weak	50	0.10987	2½	25	with saliva
P. G.	7	Aug. 14	1 E + 250 H ₂ O + 8 sugar	100	weak blue	reaction	.....	22	0.03239	2½	.	without saliva
P. G.	8	Aug. 14	.....	20	strong blue	reaction	.....	60	0.11799	2½	.	with saliva

TABLE II.—PATHOLOGICAL CASES.

No.	Date.	Name.	Diagnosis.	Test-breakfast.	Amount.	Congo.	Phloroglucin-vanillin.	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin,—hours.	Rennet,—minutes.	Remarks.
1	Aug. 4	C. F.	nervous dyspepsia	1 E + 200 S + 50 water	45	no	no	blue	16	.05110	2 $\frac{1}{2}$	45	without saliva
2	Aug. 4	C. F.	subacidity	250 c.c. of milk	15	no	no	no	28	.08395	2 $\frac{1}{2}$	30	with saliva
3	Aug. 20	C. F.	subacidity	250 c.c. of milk	50	no	no	no	21	.05297	2 $\frac{1}{2}$	40	without saliva
4	Aug. 20	C. F.	subacidity	250 c.c. of milk	10	no	no	no	53	.07972	2 $\frac{1}{2}$	30	with saliva
5	Aug. 4	M. S.	hyperacidity	1 E + 200 S + 50 W	45	blue	yes	blue	56	.16790	2	.	without saliva
6	Aug. 4	M. S.	ulcer (?)	250 c.c. milk	20	blue	yes	no	38	.10950	2	.	with saliva
7	Aug. 20	M. S.	subacidity	250 c.c. milk	50	blue	yes	no	57	.14286	2 $\frac{1}{2}$	.	without saliva
8	Aug. 20	M. S.	subacidity	250 c.c. milk	25	blue	yes	no	45	.13462	2	.	with saliva
9	Aug. 4	L. P.	atony	1 E + 200 S + 50 W	45	blue	yes	weak blue	10	.03128	2 $\frac{1}{2}$	.	without saliva
10	Aug. 4	L. P.	atony	1 E + 200 S + 50 W	15	blue	yes	no	32	.10585	2 $\frac{1}{2}$	.	with saliva
11	Aug. 4	N. H.	chronic gastritis	1 E + 200 S + 50 H ₂ O	50	no	no	weak blue	5	.00912	7	50	without saliva
12	Aug. 4	N. H.	chronic gastritis	250 c.c. milk	25	no	no	no	10	.02701	4	20	with saliva
13	Aug. 9	N. H.	chronic gastritis	250 c.c. milk	35	no	no	no	20	.00816	5	45	without saliva
14	Aug. 9	N. H.	chronic gastritis	250 c.c. milk	20	no	no	no	17	.01243	4 $\frac{1}{2}$	15	with saliva
15	Aug. 3	T. F.	chronic gastritis	1 E + 200 S + 50 W	15	no	no	blue	16	.00876	8	50	without saliva
16	Aug. 3	T. F.	chronic gastritis	250 c.c. milk	25	no	no	no	12	.00899	4	20	with saliva
17	Aug. 10	T. F.	chronic gastritis	250 c.c. milk	20	no	no	no	8	.00769	7	.	without saliva
18	Aug. 10	T. F.	chronic gastritis	250 c.c. milk	25	no	no	no	12	.00899	2 $\frac{1}{2}$	.	with saliva
19	Aug. 14	O. T.	cancer ventriculi	1 E + 200 S + 50 H ₂ O	25	weak blue	no	yes	14	.00312	4	30	without saliva
20	Aug. 14	O. T.	cancer ventriculi	250 c.c. milk	25	blue	no	no	12	.00324	6	50	with saliva
21	Aug. 17	O. T.	cancer ventriculi	250 c.c. milk	35	weak blue	no	no	17	.00259	3 $\frac{1}{2}$	25	without saliva
22	Aug. 17	O. T.	cancer ventriculi	250 c.c. milk	30	weak blue	no	no	13	.00276	4	50	with saliva
23	Oct. 15	K. L.	atony	1 + 200 S + 50 W	40	no	no	yes	13	.03874	3	50	without saliva
24	Oct. 15	K. L.	subacidity	250 c.c. milk	50	no	no	no	14	.03923	3	55	with saliva
25	Oct. 22	K. L.	subacidity	250 c.c. milk	60	no	no	no	12	.04382	3	.	without saliva
26	Oct. 22	K. L.	subacidity	250 c.c. milk	70	no	no	no	8	.03187	3	.	with saliva
27	Oct. 22	B. H.	pulmonary tuberculosis, with sec-	1 E + 200 S + 50 W	20	no	no	slight blue	16	.08724	2 $\frac{1}{2}$	35	without saliva
28	Oct. 22	B. H.	ondary gastric	250 c.c. milk	45	no	no	slight blue	8	.09469	2	20	with saliva
29	Oct. 27	B. H.	catarrh.	250 c.c. milk	25	no	no	no	20	.09587	2 $\frac{1}{2}$	30	without saliva
30	Oct. 27	B. H.	catarrh.	250 c.c. milk	55	no	no	no	9	.09974	2	20	with saliva

For control both breakfasts were introduced into the stomach through the tube.

TABLE III.

Name.	No.	Date.	Test-breakfast.	Amount.	Congo.	Phloroglucin-vanillin.	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin,—hours.	Rennet,—minutes.	Remarks.
T. J.	1	Aug. 1	1 E + 250 S	30	slight blue	no	strong	21	.0752	21	30	without saliva
T. J.	2	Aug. 1	1 E + 250 S	55	slight blue	no	strong	24	.0527	21	30	without saliva
T. J.	3	Aug. 2	1 E + 200 S + 50 W	20	blue	yes	strong	18	.0789	21	30	without saliva
T. J.	4	Aug. 2	1 E + 200 S + 50 W	25	blue	yes	strong	14	.0791	21	30	without saliva
T. J.	5	Aug. 3	1 E + 200 S + 50 W	25	slight blue	no	strong	16	.07875	21	30	without saliva
T. J.	6	Aug. 3	1 E + 200 S + 50 W	45	slight blue	no	strong	15	.03891	21	35	without saliva

In the first experiment the breakfast was passed into the stomach without saliva; in a second, saliva was added in varying proportions.

TABLE IV.

Name.	No.	Date.	Breakfast.	Quantity.	Congo.	Phloroglucin-vanillin.	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin,—hours.	Rennet,—minutes.	Remarks.
T. J.	1	Aug. 4	1 E + 150 S + 100 H ₂ O	35	slight blue	none	strong	18	.05840	3	..	passed through tube
T. J.	2	Aug. 4	same with 15 c.c. saliva	35	slight blue	none	none	20	.04935	3	..	passed through tube
T. J.	3	Aug. 5	1 E + 150 S + 100 H ₂ O	25	not	none	strong	27	.03285	2 $\frac{1}{2}$	..	passed through tube
T. J.	4	Aug. 5	same with 25 c.c. saliva	35	not	none	none	23	.04197	2 $\frac{1}{2}$	..	passed through tube
T. J.	5	Aug. 6	1 E + 150 S + 100 H ₂ O	70	slight	none	strong	20	.06225	3	30	passed through tube
T. J.	6	Aug. 6	same with 35 c.c. saliva	60	not	none	none	25	.04297	3	30	passed through tube
T. J.	7	Aug. 7	1 E + 150 S + 100 H ₂ O	50	slight	none	slight	21	.04837	2	..	passed through tube
T. J.	8	Aug. 7	same with 45 c.c. saliva	30	reaction	none	none	20	.04874	2	..	passed through tube
T. J.	9	Aug. 9	1 E + 150 S + 100 H ₂ O	40	not	none	strong	16	.03947	2 $\frac{1}{2}$	35	passed through tube
T. J.	10	Aug. 9	same with 50 c.c. saliva	40	not	none	slight	19	.03931	2 $\frac{1}{2}$	35	passed through tube
T. J.	11	Aug. 11	1 E + 150 S + 100 H ₂ O	45	not	none	strong	14	.03864	3 $\frac{1}{2}$	45	passed through tube
T. J.	12	Aug. 11	same with saliva after	25	not	none	none	29	.04112	2	25	passed through tube

In the first instance the breakfast was passed into the stomach through the tube; in the second it was masticated, and then passed into the stomach through the tube.

TABLE V.

Name.	No.	Date.	Breakfast.	Quantity.	Congo.	Phloroglucin-vanillin.	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin:—hours.	Rennet:—minutes.
T. J.	1	Aug. 16	1 E + 250 S	90	not	not	strong	18	.04279	2 $\frac{1}{2}$	..
T. J.	2	Aug. 16	1 E + 250 S	35	weak blue	yes	no	32	.09917	2	..
T. J.	3	Aug. 17	2 E + 250 W	35	weak blue	no	..	10	.02102	3	35
T. J.	4	Aug. 17	2 E + 250 W	25	weak blue	no	..	13	.05778	2	20
T. J.	5	Aug. 19	1 E + 8 Sugar	70	not blue	no	..	17	.05989	2 $\frac{1}{2}$	..
T. J.	6	Aug. 19	+ 250 W	40	blue	reaction	..	40	.10295	2 $\frac{1}{2}$	..
T. J.	7	Aug. 20	1 E + 100 S	60	weak blue	no	strong	12	.04689	3 $\frac{1}{4}$	..
T. J.	8	Aug. 20	+ 150 W	40	strong blue	strong	no	64	.12731	2	..

TABLE VI.

Name.	No.	Date.	Breakfast.	Quantity.	Congo.	Phloroglucin-vanillin	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin:—hours.	Rennet:—minutes.
T. J.	1	Aug. 31	1 E + 100 S	70	weak blue	no	strong	14	.03179	2	30
T. J.	2	Aug. 31	+ 150 W	65	no	no	strong	17	.03286	2	30
T. J.	3	Sept. 2	1 E + 250 S	80	weak blue	no	strong	16	.05427	2 $\frac{1}{4}$	30
T. J.	4	Sept. 2	..	80	weak blue	no	strong	18	.06891	2 $\frac{1}{4}$	30
T. J.	5	Sept. 4	2 E + 250 W	70	no	no	..	20	.05279	2 $\frac{1}{2}$	30
T. J.	6	Sept. 4	+ 250 W	60	no	no	..	19	.04342	2 $\frac{1}{4}$	35
T. J.	7	Sept. 5	1 E + 8 Sugar	65	no	no	..	19	.04617	2 $\frac{1}{2}$	30
T. J.	8	Sept. 5	+ 250 W	70	weak blue	no	..	22	.05213	2	30

In the first instance the breakfast was swallowed through the tube, no saliva being allowed to enter the stomach; in the second instance a similar breakfast was passed through the tube into the stomach, the person constantly masticating a bit of rubber for half an hour, the saliva, however, being collected, not swallowed.

TABLE VII.

Name.	No.	Date.	Breakfast.	Quantity.	Congo.	Phloroglucin-vanillin.	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin,—hours.	Rennet,—minutes.	Remarks.
T. J.	1	Aug. 21	1 E + 250 S	55	slight	no	strong	21.06874	24	30	through stomach-tube	
T. J.	2	Aug. 21	.....	30	no	no	no	25.06982	24	35	through tube, 45 c.c. saliva being added	
T. J.	3	Aug. 22	1 E + 100 S +	35	no	no	strong	20.06954	24	35	through tube	
T. J.	4	Aug. 22	150 W	45	no	no	no	19.06721	24	45	through tube, with 45 c.c. saliva	
T. J.	5	Aug. 22	2 E + W	40	slight	no	.....	24.04543	24	35	through tube	
T. J.	6	Aug. 23	.....	50	slight	no	.....	27.07216	24	35	through tube, with 45 c.c. of saliva	
T. J.	7	Aug. 25	1 E + 8 S	35	no	not	.....	18.05431	24	40	through tube	
T. J.	8	Aug. 25	+ 250 W	35	no	not	.....	25.05924	24	35	through tube, with 45 c.c. saliva	

In the first instance the breakfast was passed into the stomach through the tube, no saliva being swallowed; in the second instance forty-five cubic centimetres of saliva were rubbed up with the breakfast and passed into the stomach through the tube, no saliva being swallowed.

TABLE VIII.

Name.	No.	Date.	Breakfast.	Quantity.	Congo.	Phloro-glucin-vanillin.	Iodine.	Acidity.	Percent- age of hydro- chloric acid.	Pepsin: hours.
T. J.	1	Aug. 27	1 E + 250 S	70	not blue	no	strong	16	.05987	2½
T. J.	2			25	blue	yes	no	32	.09874	2½
T. J.	3	Aug. 29	1 E + 100 S + 150 W	60	weak blue	no	strong	14	.03172	2½
T. J.	4	.....	.....	30	strong blue	yes	no	40	.09982	2½

In the first instance the test-breakfast was passed into the stomach through the tube; in the second it was first masticated, then placed in a beaker and heated to 80° C. for five minutes, thus destroying the ptyalin, and then passed into the stomach through the tube.

TABLE IX.

Cases.	50 c.c. water mixed in mouth, and then evaporated down to 5 c.c.,—alkalinity.	50 c. c. of water, with 0.5 $\frac{1}{10}$ NaOH, mixed in mouth, and evaporated down to 5 c.c.,—alkalinity.	50 c.c., with 0.5 $\frac{1}{10}$ HCl mixed in mouth and evaporated down to 5 c.c.
1	12	14	8
2	16	18	10
3	10	11	6

Test-breakfast of twenty cubic centimetres egg-albumen with two hundred cubic centimetres of four-per-cent. solution of starch and fifty cubic centimetres of water.

TABLE X.

No.	Date.	Breakfast.	Quantity.	Congo.	Phloro-glucin-vanillin.	Iodine.	Acidity.	Percentage of hydrochloric acid.	Pepsin: hours.
1	Oct. 3	alkalinity 1.5	100	no	no	yes	21	.0673	2 $\frac{1}{2}$
2	Oct. 3	neutral	25	yes	yes	yes	44	.1397	2
3	Oct. 4	alkalinity 1.5	85	weak	no	yes	19	.0594	2 $\frac{1}{2}$
4	Oct. 4	acidity 0.5 HCl, $\frac{1}{10}$ normal	30	yes	yes	yes	49	.0981	2 $\frac{1}{2}$
5	Oct. 5	alkalinity 1.5	80	weak	no	yes	15	.0587	2 $\frac{1}{2}$
6	Oct. 5	acidity 10, $\frac{1}{10}$ normal HCl	35	yes	yes	yes	45	.1124	2
7	Oct. 6	alkalinity 1.5	90	weak	no	yes	17	.0592	2
8	Oct. 6	acidity 2	35	yes	yes	yes	51	.1198	2
9	Oct. 7	alkalinity 1.5	90	weak	no	yes	19	.0587	2 $\frac{1}{2}$
10	Oct. 7	acidity 6	80	weak	no	yes	21	.0652	2 $\frac{1}{2}$
11	Oct. 8	alkalinity 1.5, $\frac{1}{10}$ NaOH 1	75	weak	no	yes	18	.06942	2 $\frac{1}{2}$
12	Oct. 8		30	yes	yes	yes	41	.9259	2
13	Oct. 9	alkalinity 1.5, $\frac{1}{10}$ NaOH 0.5	80	yes	slight	yes	21	.0792	2 $\frac{1}{2}$
14	Oct. 9		25	yes	yes	yes	49	.0987	2
15	Oct. 10	alkalinity 1.5, $\frac{1}{10}$ NaOH 2.5	85	yes	yes	yes	25	.0828	2 $\frac{1}{2}$
16	Oct. 10		90	yes	yes	yes	23	.0718	2 $\frac{1}{2}$
17	Oct. 11	alkalinity 1.5, $\frac{1}{10}$ NaOH 2.5	75	yes	yes	yes	26	.06893	2 $\frac{1}{2}$
18	Oct. 11		100	weak	slight	yes	14	.02846	2
19	Oct. 12	alkalinity 1.5, Na ₂ CO ₃ 2.5	90	yes	slight	yes	21	.97286	2 $\frac{1}{2}$
20	Oct. 12	.....	20	yes	yes	yes	30	.08147	2

REFERENCES AND BIBLIOGRAPHY.

- ¹ Wright, *Der Speichel Ecksteins*, Handbibliothek des Auslandes, Wien, 1844.
- ² Bidder und Schmidt, *Die Verdauungssäfte und der Stoffwechsel*, 1852.
- ³ Lenchs, *Archiv für die gesammte Naturlehre von Kuttner*, Bd. xxi., 1831, S. 105.
- ⁴ Claude-Bernard, *Archives Générales de Médecine*, January, 1847.
- ⁵ Schiff, *Leçons sur la Physiologie de la Digestion*, Paris et Berlin, 1867.
- ⁶ Frerichs, article "Verdauung," in *Wagner's Handwörterbuch der Physiologie*, Bd. iii., S. 769; 1te Abtheilung, 1846.
- ⁷ R. von den Velden, *Ueber die Wirksamkeit des Mundspeichels im Magen*, *Deutsches Archiv für klinische Medicin*, Bd. xxv., 1879, S. 105.
- ⁸ Ellenberger und Hofmeister, *Verdauungssäfte und Verdauung des Pferdes*, *Archiv für wissenschaft. und prakt. Thierheilkunde*, Bd. xii., S. 332, 1886.
- ⁹ Ewald und Boas, *Beiträge zur Physiologie und Pathologie der Verdauung*, II. *Virchow's Archiv*, Bd. civ., S. 271, 1886.
- ¹⁰ Georg Sticker und Curt Hubner, *Ueber Wechselbeziehungen zwischen Secreten und Excreten des Organismus*, *Zeitschrift für klinische Medicin*, Bd. x., Hefte 1 und 2, 1887; Georg Sticker, *Wechselbeziehungen zwischen Speichel und Magensaft*; *Volkman's Sammlung klinischer Vorträge d. innere Medicin*, No. 100, 297, S. 2699; Georg Sticker, *Hyperacidität und Hypersecretion des Magensaftes*, *Münchener medicinische Wochenschrift*, No. 32 u. 33, 1886.
- ¹¹ A. Schuld, *Inaugural Dissertation*, Leyden, 1892; *Maly's Jahresbericht für Thierchemie*, 1893, S. 257.
- ¹² E. Biernacki, *Die Bedeutung der Mundverdauung und des Mundspeichels für die Thätigkeit des gesunden und kranken Magens*, *Zeitschrift für klinische Medicin*, Bd. xxi., H. 1 u. 2.
- ¹³ Boas, *Beitrag zur Methode der quantitativen Salzsäurebestimmung der Magen-inhaltes*, *Centralblatt für klinische Medicin*, 1891, No. 2, and *Allgemeine Diagnostik und Therapie*, Theil 1, 1894; also *Friedenwald*, *New York Medical Journal*, May 27, 1893, p. 576.
- ¹⁴ E. Biernacki, *Das Verhalten der Verdauungsenzyme bei Temperaturerhöhungen*, *Zeitschrift für Biologie*, Bd. xxviii., S. 49-71.

¹⁵ Joworski, Ueber die Wirkung der Sauren (Salz, Milch und Kolensaure) auf die Magenfunction, etc., Deutsch medicinische Wochenschrift, No. 38, 1887.

¹⁶ Kuhne, Sitzungsberichte der Mathem. u. Natur. Klasse der K. Academie der Wissenschaften, Wien, 1872.

¹⁷ Grutzner, Neue Untersuchungen über die Bildung und Ausscheidung des Pepsins, Breslau, 1875.

¹⁸ Kretschy, Beobachtungen und Versuche an einer Magenfistelkranken, Deutsche Archiv für klinische Medicin, Bd. xviii.

¹⁹ Heidenhain, Physiologie der Absonderungs-Vorgänge, Hermann's Handbuch der Physiologie, Bd. v., 1886.

²⁰ A. Herzen, Altes und neues über Pepsinbildung, Magenverdauung und Krankenkost, Stuttgart, 1885.

²¹ A. Cahn, Die Magenverdauung in Chlorhunger, Zeitschrift für physiologische Chemie, Bd. x., 1886.

CHILDREN OF FEEBLE RESISTANCE: THEIR CARE AND MANAGEMENT.

BY JOHN MADISON TAYLOR, A.B., M.D.,

Professor of Diseases of Children, Philadelphia Polyclinic, etc.

A LARGE class of cases, sufficiently distinct to be described by themselves and to be very thoughtfully considered, are feeble children. The phenomena of disease and the remedies accepted as suitable, therefore, are usually outlined for the average child, with occasional and insufficient reference, usually most casual, to those of the weaker sort, who may or should be rare exceptions. For the first, the robust entities, knowledge has attained somewhat respectable proportions, and results may be safely and confidently predicted, and on the whole realized to the satisfaction of all immediately concerned. It is among the latter that surprises arise, producing confusion and occasional dismay, the results of which react, unfortunately, too often upon the physician.

It may be said, then, that an exceedingly useful item of equipment to the adviser or lover of children is a prompt and accurate appreciation of the marks of defective resistance, and it is a conspicuous evidence of wisdom to predicate how and when these may be so handled as to produce known results, be these good or bad.

Feeble children, as I use the term here, are those who are below the normal in their resistance to the numberless and unceasing hurtful agencies which must be met and overcome throughout the length of an ordinary span of life. Some children are beset accidentally with more perils and baneful conditions than others, but because they possess larger inherent vitality, vigor, reparative power, or howsoever this quality of resistance may be described, pass through successfully what casts others out of the running, for shorter or longer periods of time.

This quality of feeble resistance, negative though it be, is a powerful factor, which requires the gravest consideration at all times, and is one of the fundamental points on which to base prognosis and modify treatment. It also requires special consideration and treatment for itself that the vital forces may, as indeed they can, be improved and strengthened by judicious measures. Thus is the individual improved and a second generation raised to a higher plane, or at least thus may we limit what had otherwise been an inevitable decadence.

The medical adviser often fails of his duty here, he being too content with the application of remedies to obvious disturbances,—certainly a more limited view than the trend of modern medicine can justify. He should assume the privilege—indeed the responsibility is mainly his—of doing much more than this. He may not, as society is now constructed, have it in his power to aid in the selection and mating of the parents. Attempts to go so far would be met with swift and dire reprimand, as some of us have found to our cost. The time may come when his advice shall be sought even here, to the profound betterment of the race. This will be a probable outcome of our growing knowledge of inheritance and predisposition.

The study of degeneracy may yet be fruitful of good results, even though it flare out in the bombastic ravings of certain noisy fellows exploding here and there in popular books adjusted to the morbid cravings of the current journalistic demands.

A general interest in and popular knowledge of the marks and dangers of the degenerate individuals is a hopeful ground, out of which may grow, conscious or unconscious, selection among human beings.

Among animals instinctive selection is the rule. It is left for human beings to be influenced far more by whimsical, or social, or pecuniary considerations, whereby the race is kept at a lower level through propagation from inferior specimens, or at any rate not the best ones.

We may at least hope for reformation on these lines as knowledge of the causes and results of injudicious marriages becomes fashionable.

But it is the part of wisdom to bear in mind that the attempts of individuals to thus exert influence is both doubtful and perilous (to the reformer). Meanwhile, we must study the material under our hands and continue to hope for co-operative effort by slow degrees.

We Americans have drawn heavily on our heritage of intrinsic vigor had from our European ancestors and supplemented by the vitalizing life of pioneer days, and are now accused of being on the verge of a decadence. This may not be altogether true, and statistics do not support that view. Certainly the average staying power of the native-born population is among the best. Unfortunately, the steady additions now made to our ranks are no longer chiefly the sturdy seekers for "open room and verge enough" wherein to swing the axe or drive the plough, but are in great measure degenerate and criminal offscourings from European nations, who are wise enough to rid themselves of such rubbish.

This intermingling infects our wholesome stock with various hurtful racial, neurotic, and nutritional peculiarities, tendencies, and diseases. The influence of all this must be ceaselessly watched and guarded against wherever possible. Mixed races are proverbially feebler than peoples of pure stock, conspicuous in the adulteration of the white with various colored races, and this is also seen in the American wherever several nationalities fuse.

City life is of itself unwholesome and devitalizing to those who remain under the conditions of overcrowding, inevitable in large centres of population. And all this, too, quite independently of the more obvious or tangible hurtfulness of inferior hygiene, poor food, defective light and air. The unconscious agitation of the molecules induced by ceaseless hurry, swift movements of objects all about, noises, sights and sounds, the jarring of the very houses from perpetually passing ponderous vans and street-cars, and endless other elements of unrest, wears and wearies and exhausts.

Not long since a patient of mine, a child with typhoid fever, became quite delirious, almost comatose, and the "strike" of the trolley men came on. The temperature thereupon went steadily down almost to normal, though acute consciousness did not return. Suddenly the "strike was off," and the thundering, clanging cars began their racket, and at once the temperature rose to 104° F., giving us great alarm, though the child seemed not to recognize the noise at all.

Notwithstanding the many menaces in the outlook for our American people, we are demonstrated to be, on the whole, steadily improving as a race. The filthy gutter-stream poured into our clean waters not only is amply diluted, but some blessed inherent qualities of our soil induces steady subsidence.

Moreover, the inevitable exhaustion which was showing in us, the outcome of our earliest years of intense struggle in all ways and producing a sad crop of neurasthenics of all grades and types, is being again overcome by improved modes of living and conserving of energies. One of the most effectual of these is our better appreciation of *leisure*, a word only recently introduced into American "vocabulary." Regular and frequent outings become more generally recognized as imperative among our "hustlers," the working years of the bread-winners are notably increased, and above all the second generation shows more evidence of surviving.

But it is vain to expect a restoration to the plane of initial vigor which our English cousins enjoy (who can still boast a higher per cent. of staying power than we), short of several generations, pursuing proper modes of work and play suitably combined. It should be our aim, however, to acquire in our own persons and for our children that invaluable possession, a predisposition to be and remain strong, through which we may triumph over endless depressing influences.

Individual susceptibility shown to poisons, medicines, irritants, and foods warrants a passing remark.

Among the conspicuous illustrations of feebleness is the curious and unaccountable disturbances set up by relatively innocent things in children of low vitality. To be sure, in the history, very many times there is a grain of wheat in a whole measure of chaff, and many of the peculiarities claimed by fond mothers are partly imagined and partly an hysterical overgrowth. Nevertheless, there are many clearly-marked idiosyncrasies which must be duly considered whenever a prescription is written or a regimen outlined. Children bear some drugs in doses which as adults they could not endure. The use of these should then be in ampler doses to secure a desired effect.

The susceptibility to digestive or other disturbances caused by ordinary foods is, however, of more importance in this research.

A family of eight children among whom I have grown up cannot take cow's milk without suffering a sharp gastritis. A baby of one of these was most difficult to feed during an attack of mastitis in the mother, and even the selection of a wet-nurse was a grave problem. In other respects it was entirely vigorous and thrived famously upon the mother's recovery. In another lad the mere tasting of hen's eggs, and it may be of other varieties, sets up a violent poisoning (stomatitis) in a few minutes, no matter how small the amount or perfectly concealed. Acute œdema of the mucous membranes is produced and urticaria so severe, and of the glottis twice, that the dyspnoea imperilled life. Susceptibilities to the action of sweets, certain berries, as the strawberry and raspberry, the presence of some flowers, are matters of common knowledge. The effect of heat, especially that of the sun, is dangerous to many, naturally in infants, and deserves more than merely a passing allusion. Sea-air, or rather the atmosphere at the very edge of the sea, which may involve several factors, is disastrous to some little folk. I am of the opinion that much of this is dependent upon perpetual small concussions, either conveyed through the air, especially through sense organs, or the rhythmical beat of the surf, transferred like bone conduction along the shore to the sufferer. One family of my acquaintance have tried again and again to overcome this apparent frailty, but are forced inland (a single mile will do), or else they become exhausted. In other cases altitude is hurtful, and quite independent of such local weaknesses as catarrhal states, emphysema, or dilated hearts. The dampness of some localities causes great distress to some, while for others a marked dryness is equally disturbing. Goethe relates how he was made ill by a deadly odor which assailed him whenever he visited Schiller, until he found that the latter poet felt a craving or need for the presence of apples, and these he kept in various stages of decomposition in a bureau-drawer of his study. Many persons are known to faint without knowing why if a mouse be in a room, or to feel similarly affected by some other animal.

The marks of feebleness are manifold; far too numerous and varied to discuss at length, and obvious usually to a watchful person, medical or lay. No one nor one dozen symptoms are competent to designate so variable a state, and no enumeration of points of organic depreciation would make the

matter clear, unless described with large attention to side-lights and modifications or upon the case in clinic fashion. Experience with or the accurate histories of patients is needed to form the judgment. A loss of interest in surrounding objects may mean physical or mental defect, but not indeed unless many other points are estimated. An excitable idiot takes a vivid interest in everything in sight only ; this is obviously the reverse of intelligence, and is seldom sustained. Scant endurance or limited staying power is a notable mark of frailty, though this gives little knowledge of relative susceptibility to disease.

Again, an important study is the critical periods in development and how they vary in different individuals,—a large research in itself. It is a common experience to note a sudden stop in wholesome progress, mental or physical, or sudden leaps and bounds in the right direction, or surprises as to one side,—oblique progress not always to be welcomed and only moderately controllable. Precocity is at one end of this line, premature senility at the other. Sudden advances are occasionally made which astonish observers as well as delight parents, the result being, perhaps, in the end admirable. The curiosities of stature growth are now and again startling and disconcerting, especially when the tall child suddenly stops in the midst of right increments, and, on the other hand, when one in whose size great satisfaction is felt, suddenly shoots up to the proportions of a light-house. Here there may be no possibility of control, but I decline to believe it. There must be means to control some of these extreme variations, and we shall yet find and apply them. The interesting point here is the relativity of the vital organs. The suddenly tall person probably has no proportionate growth of heart and lungs and therein is frail. The short folk are again often seen to be obviously built for great size, and consequently possess, presumably, bigger and more forceful organs. Indeed, the strongest men are short, and tall men are rarely long lived or very enduring.

Great progress has been made in conserving the gross vitality of the race. In this, the expectation of life, the average length has advanced markedly in recent years. If this was due to real progress in conserving vital forces all along the lines of life (age, condition, race, etc.), we could rejoice greatly and congratulate ourselves on a definite gain over past ages. Unfortunately this is not proven,—despite our vaunted medical progress, faithfully and conscientiously studied as it is,—but Dr. John S. Billings (in his lecture on "Vital Statistics," 1889) concludes that this increase in the expectation of life is only true of the earlier ages, and because more persons of feeble constitution are now nursed to manhood. The decrease in mortality is due chiefly to the better care of infants and the prevention of contagious diseases.

CARE AND MANAGEMENT.

Treatment.—The upbuilding and repair of weakly children should be considered on broad principles, the basis of which is elaborate thoroughness

and abundance of time. It involves special attention to dietetics, including a critical estimation of varying states and capacities of digestion, all the ordinary hygienic measures and the hopeful use of some drugs. There must be insisted on for such, during both average health and during illness and convalescence, more rest for the mind and body than is necessary for the average child. All outings and exercises, both active and passive, should be supplemented by rest lying down for as long a time, it may be minute for minute, as the active periods. This rest is necessary to enable lowered organic processes to regain their customary tone, and especially to secure definite gains. It will often be necessary to precede food by a period of rest, to enable the digestive activities to do their work; otherwise, the highly sensitive nervous distribution to the digestive apparatus will fail of its full energizing. Agitation impairs the even flow of the circulation so necessary for weakened organs, particularly the brain, whence governing impulses perpetually flow, dominating the body and spirit. Therefore, too, the emotions must in the weakly be not only kept well under control, but subjected to the least possible disturbance or exaltation. The temperaments (or mental attitudes from which they view life) of all children require steady and patient training. Even in the home a clear recognition of these is needed. In the case of strong children equipped with clear, dominant, healthy minds, it is undoubtedly true that fair results come somehow from very diverse and ill-directed influences; but for the weaker ones impressionable or apathetic, thorough conscientious study and specially directed measures are required.

For such little folk it is not enough to prescribe suitable medicines and enumerate casually a lot of easily-digested foods which the mother shall provide, nor to direct proper bathings, outings, and other general measures. A thorough systematization of the entire daily life of the child is infinitely more efficacious than the most accurately-selected medicines or the use of that innumerable host of children's foods which, in the form of specious descriptive circulars the enterprising chemists flood our morning mails. The best tonic for the stomach is food carefully prepared, such as a fairly intelligent mother in even the humblest walks of life, if rightly directed, can readily afford, but always provided that the times and circumstances of the administration be wisely chosen and rigidly adhered to.

Predigestion of food-stuffs offers undeniable safeguards to the weakened, toneless digestive tract, but robs the pabulum too often of that savoriness which is essential to acceptability, and hence imperils appetite.

While exercising care as to the quality and preparation of foods for weakly or convalescent children, it is imperative to bear in mind the need for suitable variety. This fact I have time and again verified. A child will be presented who is fed with the utmost care and regularity, oftentimes under the best of medical advice, and yet its progress comes to a standstill, or it is seen to obviously lose. Upon inquiry there will be revealed much sameness in the diet list, otherwise properly adjusted to the condition

for which it was originally outlined. The little victim's soul comes to loathe and abhor the sight of flabby paps, occurring in dismal routine, or the same old, wearying round of bread, meat, and a dab of vegetables. If to these are now added a more varied dietary, revising the menu day by day, even lapsing into a taste, now and again, of articles ordinarily denied yet savory and tempting, great progress will soon be obvious.

The growing practice of sterilizing milk for infants and children, invaluable as this protection is for temporary use during hot weather in cities, often leaves anæmia and tonelessness in its train if its use be persisted in. There is a value in the vital properties of fresh milk not to be produced or retained by any artificial process.

The utmost care needs to be observed, however: first, in the quality of the milk, which includes an estimation of the health of the cow; secondly, strict regulation as to the treatment of the milk while being gathered and immediately thereafter, and, finally, the greatest conscientiousness in securing cleanliness of the containing vessels. These conditions, though difficult, are becoming more and more possible as knowledge grows, and if fulfilled will bring a perfect article to the consumer.

The points which certainly do not obtain adequate general attention are the thorough systematization of the when, where, and how much of these foods shall be taken; what *varieties* shall be insisted upon; the times, kind, and suitability of bath, the amount and character of exercise, and, above all, definite periods of *rest* before and after feeding, so that the organs shall be able to act deliberately. First, then, when confronted with an ailing child, one who is not ill, but far from well; when appetite is variable but small, when sleep is restless, the digestive organs manifestly disturbed and temper fretful, one that fails to hold its own in play among its fellows, and, what may not be ignored, whose weekly school report shows decided backsliding; first, I say, look the little fellow over thoroughly and in all respects.

There may not be one organ more amiss than another, though the most obvious faults will usually be seen in that avenue to all vital power, the *prima via*. There may be yet no falling off in weight, a far more instructive index in a child than in an adult, nor an obvious anæmia. There may be a quicker pulse than ordinarily, a change in the heart-sounds which the initiated will recognize but cannot so clearly describe; there probably will be found, if so much trouble be taken, a rise in temperature, slight but unmistakable at times, at others subnormality well marked, and there is great probability that neither the attention nor other exertion is readily sustained. The child, in marked contrast to its healthy comrades and itself at other times, is willing to sit aimlessly, if not a martyr to energetic taskmasters, or to an over-strenuous conscience which drives its willing victim to the verge of perpetual exhaustion, and often over it into the pit of complete collapse.

Such cases as here pictured are common enough, if only the eyes are open to see them. They escape attention only too readily till some malady

seizes them in all their pitiable weakness, and life is speedily quenched. It is a worthy quest, then, to seek out and rescue these from, it may be no picturesque fate, but an ever-present menace; to rehabilitate these unresilient little bodies, and even make them better than before; to put them in the way of a sound bodily equipment for their life-work anon.

Here is a little sketch of a sort of modified rest treatment which produces excellent results when all other efforts have failed to start a child along the line of progress. Put the little one in bed and keep him there from a few days to a week or more, and write down distinctly for the mother a strict schedule giving the exact hours for feeding. These may be the ordinary three meals with some little fluid food taken in between whiles, or better, direct four meals to be given in the day, at, say, seven, twelve, four, and eight o'clock, the largest meal at noon. Omit the tonics hitherto given and add digestive ferments, or malt, or both. Let the day begin with a sponge-bath in a warm room, then a light breakfast daintily served. In the early afternoon let some one rub into the trunk and limbs an oil; olive oil is very nice and much of it is thus absorbed; cod-liver oil is better, and not disagreeable if free from rancidity and one-third part soap liniment is added, which probably aids the osmotic action. This serves as a form of passive exercise and also a nutriment, or at least a tonic to the skin, circulation, and surface nerves. The surface should be thoroughly wiped off afterwards, that no foulness remain. I have seen children immensely benefited, even among the poorest dispensary cases, from this one measure alone. Above all, in the early course of these measures, if the child manifest a desire for toys they may be allowed sparingly, but aggressive entertainment by over-officious persons is a harm and an offence and should be strictly forbidden. After a few days or a week the range of one sunny room may be permitted, but still the child should be let alone, and in most cases it will be happy and amuse itself.

Frail children require systematic development of their various organs, as well as of their muscles. To be sure, it seems scarcely practicable to develop some organs, as a stomach or a kidney; nevertheless, it is possible to do so. It is abundantly obvious that the eye and the skin can be developed, and it is equally important that all these organs should receive attention in the aggregate and separately, especially where there is a manifest under-development of the one or the other, which then should receive specific attention.

To take first the eye,—an infant can sustain very considerable damage to its eye by objectionable exposure to light, which may be too strong, or too sudden, or too constant. It may readily have its eye-muscles disturbed by an habitual attitude, as when, by reason of a weak back or other disability, it is confined to a single place, as a chair, in a customary situation in the same room, straining vision in one way, and many other objectionable practices which common sense and observation will make evident. By the same token, this eye or pair of eyes may become developed, not only in

its organic capacities, in the judging of distance, inviting refractive adjustments, etc.; but, as intelligence increases, great good can be accomplished by a thoughtful use of interesting objects which may excite the child's wholesome interest and educate its perception.

There are experiments now afoot, that at least promise well, by which children can be taught so to perceive differences of color, in form, and the arrangement of objects, as will greatly facilitate their comprehension of natural phenomena. It is quite possible that along this line may be found means to prevent defects of sight, such as color-blindness, as well as to check the progress of myopia and other refractive errors.

One practical point suggests itself here, and that is, the great unwisdom of submitting babies to rapid journeys, the looking out of windows at swiftly-passing objects while flying along. We have seen migraine apparently develop through the custom of giving a couple of small children long exercise in a carriage with a pair of fast horses every day. We have certainly seen instances of profound disturbance caused by this means, and it is reasonable to infer that a continuance of such like objectionable measures may produce lasting damage upon so delicate an organ as the eye, and the whole sensitive organism thus is imperilled.

The custom of encouraging a child to sleep while being driven about is unwise. The motion is both regular and subject to sudden irregularities. The persistence of one kind of motion up and down is bad, not only producing relatively unsound sleep, but keeping up a molecular agitation throughout, which has little to recommend it. If the infant be awake and sufficiently old and alert to sit up and look about, or to be forcibly held by the nurse in an upright position, a strain is put upon the spinal column. Thus, continuous mild concussions are administered to the spinal cord and brain, thus the eye is put upon the strain, reacting directly upon the brain; an element of excitement is introduced and physiological irritability is a probable result.

The development of the skin is of paramount importance in the young, as upon its capacity to endure changes in temperature and other states will depend much of the future healthfulness of the individual. Some children have the layers of the skin unformed from the first, and it never acquires normal activity. There is quite a large variety of skins obviously different to the observant persons,—the firm, glossy, or velvety skin of health, the pallid, flabby or leaky skin, readily becoming over-moist, loosely attached and wrinkling readily, or the yellow, harsh skin, either flabby and toneless, or stiff and inelastic, adhering to the bone, or seeming to do so. Some skins are insensitive and react to almost no stimulant; others chafe and get out of order if only thin clothing press upon them, hypersensitive to all agencies.

The skin of a red-haired child is always tender and usually beautiful. Children predisposed to tuberculosis or scrofulosis have poor skins, which can be and should be immediately improved. Various neuroses show in

the skin. In short, the surface of the body is of vast activity, and the cultivation of this large part of the organism is of critical importance.

Now, as to the means of improvement in our control. I believe if babies were anointed with oil from the first, and cleansed by rubbing them off, not using water, or but sparingly, for weeks or months, their skins would become more vigorous than when soap and water are freely used. This I have proved by a series of cases observed (and published), three of whom were my own offspring. Exposure of the skins of infants to the air of an equally heated room is wholesome, and they are better for as much exposure as possible, always short of chills. In America we are subject to such sudden and extreme changes that we dare not allow this as freely as is safe in many other countries. The exposure of knees and shoulders in children not the most robust is dangerous unless carefully watched and promptly covered at the approach of chilling conditions. In-doors it is of use, out-doors not to be recommended to all. To go barefoot is wholesome for many. Almost never do children hurt their feet, and thus only are the feet symmetrically developed. They do not increase in size seriously. I know of numbers of Southern girls with feet entirely beautiful who ran barefoot in warm weather until they were almost grown.

Cautious exposures can induce a tolerance of skin and feet exposure which will greatly strengthen the whole organism and should be encouraged. The clothing at no time should be one bit more than necessary to protect. Over-swathing lessens energy to a most surprising extent; it throws the volatile elements of excretion back into the blood and directly poisons. The skin should be able to throw entirely and promptly away its effluvia, which should be suffered free escape or it will damage the lungs or kidneys. When we bear in mind the capacity of the surface blood-vessels, and how greatly the vascular dilatation or contraction alters the state of the varying blood-supply to internal organs, also how large is the amount of matter excreted by the skin and many other points involved in its functional activities, we at once recognize the importance of preserving its integrity at all times. If these activities are anatomically undeveloped or functionally impaired they demand our best attention. Natural means are best, judiciously controlled. Exposure is important, always with caution. Bathing should be frequent, daily, indeed, or in hot weather, oftener, in as cool water as can be enjoyed or well endured, but gradually if unaccustomed. Bathing should be followed by thorough drying and rubbing, and prompt covering; weakly folk should lie down awhile after. If chilled let them get into bed for a time till complete reaction comes or fatigue goes. When bathing cannot be so well endured, at least so often as may be indicated, then a dry rub will suffice, especially after exertion and opening of the pores. If all this tires the child it should lie down, and the work be done by another person. Soaps are to be used sparingly and only for cleansing. Salt is almost as cleansing and more stimulating. If the skin is tender, bran decoctions added to the bath will soothe. Ammonia or sulphur added

to the water has value, rendering it soft and exerting special effects. To begin cold bathing, let one unaccustomed stand in three inches of warm water and be sponged off in cool and cooler water. The custom of the Greeks to exercise naked anointed with oils has much to commend it. The rolling in the sand of the arena in wrestling was accredited with benefit and no doubt rightly. Wading at the sea-shore and digging in the sand is analogous, and much to be commended if not too prolonged. Swimming comes next to bathing, and is among the finest agencies for invigoration of skin and muscles. Remaining long in the water, above half an hour, is of doubtful value, and over an hour is a strain, and for several hours is hurtful to any but the strongest, and does them no good. Water colder than the air of the bath-room is often hurtful for the strongest and of little or no value to any. Shower-baths and needle-baths are terrifying to most children, and possess no advantage over sponging or plunging. It is best for little folk to encourage cool bathing by gentle graduations and to make of it a reward or frolic.

The exercise of the lungs next to the skin requires much attention. First, it is necessary to make sure that the avenues to the lungs, the nose, and throat shall be clean and healthy. Upon proper lung action depends the aëration of the blood, and through these the complete activity of the remotest organ. Upon the integrity of the epithelium of the respiratory passages depends in great measure the defence of the organism against the onslaughts of many microbic poisons.

The nose and naso-pharynx must be kept free of irritations and pathologic changes, which may limit function or obstruct the in-and-out go of the air. Upon the competence of the lung-expansion will depend the completeness of oxygenation and the integrity of especially those portions of the lung which are less liable to a full distention, as the apices, so rarely developed and so vulnerable, and also the lower borders. The development of the lungs, of course, is more commonly obtained through normal activities, but if for any reason these are impaired, as, for instance, lameness, an enfeebled or damaged heart, or a weak, nervous organization, and the child be not able, or it may be unwilling, or, at least, indisposed to wholesome action and exercises, then it is essential not to lose sight of the necessity of getting these lungs sufficiently dilated for their proper growth and the continuance of their integrity. For feeble children it is convenient to induce them to play at certain games which may involve deep respirations and forcible blowings. Indeed, one of the first accomplishments to teach a child is to blow its nose properly. Pretty much every child in America inherits or may develop a condition of pharyngeal catarrh. To be sure, among the Greeks, it was considered a degradation to be obliged to blow the nose, and a most impolite thing to do, but the reason for that was their perfect health, and a large part of this was the magnificent attention their skins received throughout their earlier and later years.

Our children will almost inevitably acquire occasional catarrhs, and

they should be early taught to free the nose of this secretion. The way to do this is to teach them to blow a long, steady blast, holding the handkerchief against one nostril the while, and then holding the opposite nostril, to take a long inspiration, and then to blow steadily out of the other one. And then, if not free, to repeat this process on alternate sides, at least twice. Then the air comes and goes freely, as it should, to the lungs, suitably warmed and screened.

Hearing, also, needs attention in the same way. As is well known, those children who habitually hear good music have this sense-perception well developed. The sense of smell, while deserving of attention, is rather more likely to be over-developed to the point of squeamishness than to suffer any lack in this direction, seeing that in the evolution of the race the nose has clearly less need of development than in the savage state.

In the matter of taste this merely need be alluded to, but might be discussed to a very interesting length.

CAUSES OF FEEBLENESS.

The causes of feebleness are of wide variety and not to be clearly differentiated always, many times overlapping. They may be divided, for the purposes of clinical study, into those which are (1) inherited, (2) intrinsic or essential causes, (3) developmental, (4) acquired. The inherited causes of weakness are rather those of predisposition, "a type of tissue soil," an attitude of trophic energy, a tendency to this or that condition, active or passive, in which there is an element of remote or near heredity. And here also come in racial characteristics, the peculiarities produced in races by living in certain narrow conditions, it may be, of deprivation or moulding environment, lessening the powers of resistance. This is commonly seen in localities where the people have lived under certain similar conditions for a number of generations, or where salient characteristics show themselves throughout a family strain.

Such cases as these are being continually modified by changed circumstances, and are studied with more divergence of conclusion than most other things. The views of some of those who write upon heredity are sometimes wrong, at other times silly, and rarely of much practical value. This matter will be touched upon under predisposition. Intrinsic causes of weakness are also to be called essential; or, we might make use of the ancient medical term "idiopathic," still a respectable cloak for our ignorance. There are numbers of children in whom we find marked lack of vigor, a miserable capacity to react against depressing causes, and in whom a very careful search fails to reveal any recognizable or rational ground for their feebleness. Such a child may be one of a family otherwise vigorous enough, in whom there is no good ground for accusing heredity or collateral conditions. Moreover, while it is readily possible to put one's finger upon the few apparently adequate causes having to do with the early upbringing, nevertheless, upon equally careful search in the records of some of the children

of the same parents, a very similar history may be obtained. So, as a matter of fact, there is no rule of guidance to be elicited; the child simply is not strong. All we can do is to recognize that such children as these are deficient in vigor and take the necessary precautions for repair and for development.

It has seemed to me that a likely cause for this condition will be found most times in a lowered state of vitality in the parents, especially in the mother immediately preceding birth or during gestation. Therefore this might be called prenatal. Children of an aged father, even though by a vigorous mother, are almost always frail; also the offspring of a mother in the late-bearing periods. But not much is to be gained by a variety of terms, all more or less conjectural and descriptive, but entirely irremovable, and it is better to be content to recognize isolated cases of weakly children when we see them and to set ourselves sedulously searching for remedies rather than classifications.

Next comes the subject of developmental causes, which oftentimes are forcefully operative in producing a wretched child, who might readily have been a fine, vigorous person if rightfully handled. This is a very important subject and warrants a fuller consideration than the others, for many reasons, chiefly, however, because such cases are susceptible of large improvement as we meet them; but if we could have gotten hold of them earlier, or had they been soon enough recognized, this gain might have been made most satisfactory. There is too much reliance in the mind of the average practitioner on the abundant powers of nature acting with the accidental environment of the child. Children are left much to their own devices to grow as they may, and this is safe enough if only they happen to be primarily well endowed with initial vigor, and if the accidents of their surroundings and influences are, and continue to be, wholesome. By no means should we interfere with the normal processes of healthy, natural tendencies; spontaneity should be always encouraged. The best human beings come from healthy, humble households, more often found in the country or in villages, where domestic methods are simpler and the exciting or complicating factors are fewest. It may be assumed that in the cities not only are the perils which beset the infant far more numerous, but the opportunities for right development are less, and need especially the watchful care of parent and teacher, and, above all, the skilful supervision of the medical adviser. Civilization may not be the boon we delight in regarding it, for undoubtedly the highest products of civilization are not, as a rule, the best equipped with working powers of body or mind, and it is beyond peradventure that in the more crowded cities with all their improved sanitary conditions the most pitiable instances of degenerate humanity are found.

Here, then, is need for our best endeavors to bring out and improve the latent possibilities of the future bread-winners and propagators of the race. Not that all virtue resides in country air, or that to the city child an inevitable blight continually threatens; but human beings can only be expected to develop in proportion to the two factors,—one the primal

capacities, the other opportunity. Moreover, whereas water may be induced by much skilful modification of the laws of nature to rise higher than its source, its normal course is to fall along the lines of least resistance, to go where it may, and to take its color from the soil over which it flows. And so with all of us from the cradle to the grave, we strike our level soon or late. And if peradventure some attain to great bodily or mental eminence, it is mostly through good help enjoyed, or at least by escaping hurtful opposition. Considering, then, the developmental needs of the child from the physical stand-point, we may divide the subject thus: Of a normal child, as we may assume him to be usually found, equipped with a good foundation of bodily integrity and original competence, there is much that may be said concerning opportunity and encouragement through various developmental epochs as a babe, infant, child, youth. And these again are somewhat modified, especially in later years, by the differences of sex. It should be recognized, too, that those on different planes of life require different kinds of advice and privileges. Especially is this true of those confined to the pernicious wastes of brick and stone, of alleys and gutters in our large cities during the none too blessed summer. Even a day in the country now and then is a godsend to them.

I cannot refrain from saying just a word as to the imperative need of effort we all, every citizen, should make to maintain and enlarge our open spaces and play-grounds, our river fronts, our public gardens, to establish roof gardens especially, and every means by which the city child shall be aided in conserving its much imperilled health and widening the possibilities for reasonable growth. The power to do this should stand in direct relations to the school boards, and those of the educational offices hold a rare privilege and grave responsibilities in their hands which we must see that they use aright. The very dearest and healthiest enjoyments of a boy's life are connected with forms of warlike sports, some mimic strife or game of hunting, and unless opportunity be given to work out these wholesome and legitimate tendencies on a bit of open ground, the forces become explosive, revolutionary; therefore mischief and destruction or absolute viciousness ensues, to the hurt of the community (which, being abundantly policed, may be able to stand it), or worse, to the child itself, whose nature is thus embittered, and the outcome is disease not only of body but of character and morals. The child who begins life without a fair start, handicapped by some form of developmental shortcoming, if through the public fault, acquires a right to demand of the State thorough and skilful investigation. Medical men, teachers, and philanthropists habitually assume that the child is a perfect piece of humanity, which merely requires moderate opportunities and encouragement to develop. They need much more of skilful guidance if they possess the average parent, who is, as a rule, too busy and too unwise to direct them intelligently in physical and mental habits. Home teaching and influences are theoretically best, but they can in most instances be enormously bettered, and the way to do this is to call the

parents' attention to their responsibility and give them a few sound rules of guidance. Better, still, teach by example, and we should all strive to interest our children by our companionship, our intimacy.

The acquired causes of frailty in children are too extensive for me to attempt to enumerate and classify, and have to do, rather, with the whole subject of infantile disease and those effects which are not fully recovered from. The healthy organism throws off acute disease, and little or nothing will remain unless some organ or tissue be inflamed a little more than its power for repair, and this remains either damaged or over-susceptible to other morbid agents. There is much force in the arguments of those who assert that all disease has at its base the element of fatigue, and at some future time I hope to present my observations on this subject more thoroughly. During the process of development there are many periods wherein symmetrical growth is more readily disturbed and the effects of fatigue made manifest. Prolonged tension tends to kill, not only growth, but that which should accompany growth,—namely, joy. Adequate rest, as has been alluded to many times in this paper, is not only an important but a complex subject, requiring careful study and attention. Direct results of fatigue have been shown to produce temporary color-blindness, loss of memory, and slowing of reaction times. It is quite within the experience of any careful observer of children that it may produce a great many other effects, ephemeral, temporary, and permanent. The working with dulled minds produces bad mental habits. Functional activities in a growing organism subject to strains unduly severe and prolonged inevitably result in disordered and probably diseased organs. Then, again, there are numberless causes which increase latent susceptibilities, or create them, and conspicuously lessen resistance to infective agents. The much-talked-of sewer-gas works rather in the way of increasing the susceptibility to diphtheria, typhoid fever, and other filth diseases, than as a direct agency in their spread. In so specific a disorder as rickets, thoroughly good opportunities may altogether overcome even a well-marked inherited taint, and, on the contrary, a perfectly healthy baby may develop a type of tissue soil which will result in rachitic feebleness.

Predisposition.—Each and all of us are exposed to forms of infection, poisons and devitalizing circumstances the defence against which is a relative degree of inherent immunity.

Predisposition is that condition of the body in which causes that leave other persons unaffected call forth an attack of disease in one who is predisposed. Predisposition may be inherited or acquired, and is used generally to signify susceptibility to the infectious diseases by which the parts and forces of the body lose their defence against the invasions of pathogenic organisms. Immunity, on the contrary, is that state or condition of the body, its parts or its forces by reason of which it is able to resist the development of morbid or infectious processes. These may be divided into natural, acquired, and artificial.

This question of predisposition and immunity is receiving a deal of attention at the hands of investigators nowadays, and most valuable studies are in progress in laboratories the world over. With the special studies of these we cannot here now deal, but it is one of the most important of the fundamental items of medical knowledge. It is well established that individuals vary exceedingly as to the degree of their predisposition to disease as well as to the variety of agents to which they are susceptible. Not only so, but this variation involves seasons, times of growth, and various conditions. A great many microbic poisons, or the causes which produce these, are present not only in the environment of most people, but are to be constantly found in the normal secretions of the mouth and respiratory tract. This is especially true of pneumococcus of Friedlander and the staphylococci. Others are more or less constantly found, many of less gravity, but even the deadly tubercle bacillus is round and about us at all times in any ordinary community, and may frequently be found not only under foot but in the air all about us, and actually laid away in the cavities of our body ready to infect it upon occasion.

The proportion of persons predisposed to infectious diseases varies, as has been said, in some periods being almost universal, while in others, limited. Epidemics can be explained by the varying equation due to predisposition and infective power of infective agents. Children frequently escape infection which attacks others all about them with precisely the same environment, and may pass through an epidemic unscathed. Nor is it true that we can always or, indeed, often predict who is and who is not thus susceptible. The most robust fall ready victims under certain conditions,—the feeble ones then resisting well. A little later this may be reversed, and the feeble ones are attacked.

As our knowledge grows we may be able to learn what are the factors that enter into these equations, and how we may be able to predicate one or the other. And, indeed, the present outlook is most hopeful for practical results. Koch suggests three specific causes of tuberculosis: first, destroyed or damaged ciliated epithelium; second, denudation of the protecting epithelium of the bronchi; third, deformities of the thorax and adhesions of the lungs, hindering full expansion and rendering them liable to retain secretions holding infectious matter in suspension. And yet these by no means explain susceptibility. There must be some essential change in the cells and juices of the body: anatomical, structural, blood-supply, lymph-supply, and the like; disturbed states of the leucocytes, the integrity of the phagocytes, and the blood and blood serum.

There are also admitted to be "places of less resistance." Certain of the organs and tissues differ in their local cell weaknesses, as the throat is more susceptible to the poison of diphtheria, and they also differ in their resistive and destructive powers with regard to the microbes, and again to the anatomical and *temporary variations in* structure and also chemical differences.

Again, in addition to the barriers which nature has set up to the entrance

of these destructive microbes, common conditions in the blood itself might be considered, but their discussion would carry us too far afield. The microbes themselves require a critical estimation as to their numbers, their varying states of virulence, and whether these—although of the same kind—are pathogenic or non-pathogenic microbes. The chief defence against the onslaught of germs is to destroy predisposition. How this can be done is not yet clear, but it lies presumably through maintaining perfection in the tissues and especially in the blood integrity.

FORMS OF EXERCISES AND OUTINGS.

Every element of excitement, not forgetting over-solicitous attention and forced amusements, should be deprecated and avoided until the child acquires genuine vigor. Excitable children need to be watched with the utmost care, and the element of strain wherever detected should be sedulously removed. For very young babies merely keeping them in the open air is of great value. They should be sufficiently clothed, but not suffocated. The rule should be just enough and of the right kind, but not one bit too much; reserve overclothing to be near at hand always. In bitter cold weather veils are of great importance, always of sufficiently open mesh for the air to get readily through, but to protect from the wind. This, upon occasion, may be doubled, and had better be of dark color and natural tint. For the poor, a piece of cheese-cloth will suffice. Veils should be washed or at least cleansed frequently, as a great deal of objectionable matter, both from the expired air and from floating dust, may accumulate upon them and be inbreathed again.

There is a prejudice against a baby or a child sleeping in the open air. If, however, it be sufficiently wrapped up no harm can result. During sleep relaxation occurs, especially with children of tender, leaky skins, and surface chills may arise, but this need not be if precautions are used. A valuable form of exercise and an adequate outing is had from allowing a little child from three to five years old to play about in a room with the windows wide open, and with its usual extra clothing on such as is worn when taking its ordinary walks abroad. This form of outing can be enjoyed anywhere, at any time, for any given length of time, and the perfection with which it may be controlled is of the greatest advantage. Furthermore, by these means the care-taker watching may remain with the child and utilize the time by pursuing some employment in useful fashion the while. An apathetic little one, who without constant urging will quietly sit down and do nothing, may be kept busy or amused; and, *per contra*, a rushing, bustling little one, who would readily overdo, may be thus held in check.

Children of weak lungs or insufficient lung-expansion or with a predisposition to phthisis may be taught regulated breathings to great advantage. Also, a useful measure is to institute for these some games, such as blowing through a tube, as shooting of peas through a tube at a mark,—a

very practical means of increasing thoracic size and lung-power. An excellent in-door game is the old-fashioned bean-bag, at which the nurse can be a companion, and thus a perfect regulation can be established of the amount of energies employed. This bag of beans may be tossed back and forth so many times, increasing it from day to day and week by week. It may be at increasing distances. Both hands may at first be used, and by and by, as strength grows, the one hand or the other, not neglecting each. Both the right hand and the left may have their adequate employment, and even for stronger children this is of excellent utility.

The next step in this direction is the use of the medicine ball, which in our larger gymnasia has become quite the fashion. This so-called "medicine ball" is merely a sphere, made up of soft material, weighing from one to six or seven pounds, and covered with soft leather, the rough surface out. For little children it may be about the size of an orange, or preferably a little bigger, as being convenient to hold in two hands. This, passed or tossed from one to another, requires more skill than the bean-bag, and may be used in the same way that a foot-ball is thrown and caught, either with two hands or one hand, and soon a very large measure of skill is acquired and interest incited. When the regulation or prescribed amount of passing has been done, then it can be stopped for one or all the players. A watchful care-taker may learn this himself or herself, or act under specific instruction what to do and what not to do.

The most important element in all games is the incentive of competition, even if that competition be with one's own self. In all these exercises, which are devised for the purpose of keeping up a consistent interest, a much larger amount of activity may be used, and with less reactionary fatigue, than with any form of exercise which fails of this, no matter how eagerly one may pursue it as a measure. The converse point is, however, that vivid interest may cause a weakly person to do too much, even where he is endeavoring to do something with skill in which he himself is the only competitor. When, however, the competition is with others, the element of excitement is added, which may become hurtful to those insufficiently strong. Of games, many of the larger competitive kinds are manifestly unfit for children not overly strong. Match games of foot-ball, or even base-ball, are out of the question. Milder competitions, as in shinny or rowing, are of doubtful value; but golf is a perfect game for the feeble and the strong, the young and the old of either sex.

The evidences of over-exercise in children or in weakly persons generally must be carefully rated. Mere breathlessness is no objection, and is easily recovered from if the organs be sound. Also, a pretty free sweating is harmless enough unless this goes to the point of saturating the underclothes, exposing one to secondary chill. If, however, with very small exertion sweating comes readily, and, instead of being accompanied by a normal reddening of the surface and the face, the person becomes pallid or bluish and loses the normal lustre or brightness of the eye, then caution

must be observed. If after small exertion is seen a sort of trembling of the limbs, of the face and lips, this means that enough has then been done, and possibly too much. If seen habitually in the same individual, the amount of exercise must be limited until by slow degrees and other means adequate strength is acquired. Much soreness in the muscles afterwards is of no gravity, though often a source of anxiety.

It is a good point to note the face to be ruddy, pallid, or bluish, as an indication of benefit or harm from exercise; not that it is infallible, because some of the powerful athletes, men of greatest endurance, become pale while in action. This is, however, unusual. The pulse is a useful indicator too, and while, of course, even the most vigorous people who are in moderate condition have their heart-action immensely accelerated under sustained exertion, nevertheless this usually marks the limit of their capacity, and must not be kept up too long under sustained exertion, and if the person be in good condition, he is likely to have a full, strong pulse, only a little quickened over his ordinary state.

I once made comparison between four men climbing a high and very rough mountain, while on a hunting expedition. We were all in good condition, and one of us was an Indian boy of eighteen, rather slender, and not especially robust-looking. We all had loads upon our backs, but this boy had the heaviest, not less than seventy pounds. When, after a continued rise of over two hours, we reached the top of a certain eminence, I quickly counted the pulse of all present. And this boy was the coolest of the lot, and his pulse-rate was only a little over seventy, whereas the rest of us very nearly doubled that. When sitting quietly around the camp-fire his pulse and mine were just the same.

On another occasion, on a very hot day in summer, I compared my own son's pulse with mine, he being in perfect condition and thirteen years of age, and I as strong as most men, but unable to maintain constantly that happy state, at the time perfectly well, though not in fit condition. After having reached afoot the top of a mountain about fifteen hundred feet in height, his pulse-rate was only a little more than half of mine.

I have repeatedly examined the pulse and heart of boys under varying strains, such as a long foot-ball game or base-ball match, in which there was pretty constant action, and have noted that the condition of the pulse in those otherwise in equal condition varied very much with their excitability. And, inasmuch as this excitability of the person reflected upon the pulse means rapid using up of pabulum and rapid oxidization, therefore it is fair to assume that the rapidity of the pulse is a good indication of the using up of vigor. If the strain on the heart is too severe the result will be a proportionate exhaustion. The tissues of young folk are so clean an elastic intravascular pressure can do less harm than in the adults. The heart not only needs to be of proper size, shape, and tissue competence to fit the body, but the quality of its vein supply may be ample or lacking; when this is below par the heart acts slowly and laboriously, and is easily

wearied and its force soon spent. This is shown in dyspnœa and palpitation, "air hunger," "besoin de respirer," if long continued the result is cardiac asthma. This phenomenon is frequently observed in the healthy under customary exertion; it is then chiefly due to the normal phenomena of insufficient elimination of the products of tissue waste, and is comfortably met by a few minutes deep breathing or ample oxygenation, and most economically lying flat on the back, arms and legs outstretched, the head retracted and mouth open.

For (young or older) children the very best form of outing is to potter about a large garden, doing a little here and there and then resting awhile. The acts involved in gardening, the digging and pruning and various forms of activity essential thereto, are far and away the healthiest forms of exertion known to man. Indeed, the age of gardeners is unusually prolonged, provided they live wholesomely conditioned lives otherwise. Farm work is a different matter, involving greater strains. But the work of the garden, under intelligent supervision (or advice which is followed), is suitable for young or old, and is of the largest possible utility.

For girls or feebler boys the cultivation of flowers in boxes, or window gardening, is a healthful occupation. The care of small animals or of fish, as of birds or small four-legged pets, the making and caring for aquaria and such like things, are excellent, as sustaining interest and supplying some form of activity and variety without strain. The study of botany and field botanizing is among the best, on which I should be glad to dwell at length.

The study of birds in their natural haunts, watching their conduct, listening to and recording their songs, keeping the eyes upon their movements, especially with a field-glass, is of infinite interest. So, also, of the woodland moving things, not neglecting even ants and spiders, although using all due precautions in approaching the latter.

For older boys, even of the sickliest, provided they have the use of their limbs and reasonable integrity of their organs, there is no one form of life which so largely conduces to the building up of nervous force and muscular vigor as camping out in the woods. There is so much to be said on this subject, right sort of camp protection and varying conditions, that it is impossible to do more than allude to it with the statement that my experience has been fairly large, admitting of an expression of opinion, though few rules can be formulated short of a long essay.

The life of a boy under, of course, proper control in the woods far away from civilization is as near as possible to perfection, to aboriginal nature. He is freest there from all those minor and major disturbing influences, excitements, artificial restrictions on spontaneity which permits of healthy growth, mental and physical, encourages symmetry and fortifies against warpings.

I have seen a boy not ill, but still far from strong, about whom it was most natural to be gravely apprehensive lest the experiment should fail or

prove disastrous; nevertheless, without himself being particularly pleased with the experience, this camp-life succeeded in accomplishing what no other combinations had been able to do, even of the most carefully-selected or expensive kind. The irregularity of the feeding, the lack of sleeping comforts, the loss of various civilized necessities notwithstanding, were offset with immense effect by the simplicity of the life, the element of independence of little things ordinarily provided and thought to be needful, the absolute naturalness of the motions and attitudes, and things done, the early hours to bed, and the even earlier to rise, the constant breathing of perfect air, whether this be night or day or wet or dry, it mattered not, and many other points too numerous to mention, produced a condition which when in doubt it is always well to hopefully attempt.

Morals and religion in these surroundings need little teaching,—a hint will suffice, and this, to the narrowed mental horizon of a young person, is a vastly important point,—and nowhere better than in the woods or wilds. Confusion is usually produced in the concepts, and is a much worse thing than ignorance which is a clear field for the understanding.

DEVELOPMENT OF MUSCLES.

There is still an impression prevailing among even the best teachers of physical culture that the development of the muscles has of itself a particularly valuable influence upon the general constitutional vigor. A good deal of attention is directed by writers on this subject to various means of cultivating muscular power. This is true only to a very moderate extent. To be sure, the exercising of the muscles can scarcely be carried on independently of certain collateral co-ordinative acts involving the vital organs. By quickening their activity by that of the circulation and stimulating the ebb and flow of the blood throughout the motor mechanism, this does improve nutrition, and, to a certain degree, enhances generally the activity and power of the body. Exercising the muscles in vigorous persons with sound and competent organs adds to the usefulness of the trunk and limbs, enlarges their capacities, and is of permanent value. In the class of cases under discussion this is also true, but with many important modifications.

Let us review for a moment the different kinds of muscular actions, their mechanism, and their physiology. There are the voluntary and the involuntary muscles; ordinarily only the former are considered under the subject of exercise. The effect upon the involuntary muscles is a very important one, however, and precedes and should proceed *pari passu* with the stimulation of the voluntary mechanism. It is conceivable, and, indeed, I have seen instances which illustrated this, where individuals have acquired a species of muscular monstrosity by having their voluntary muscles so exercised as to increase their size and power out of all proportion to the organic capacity of the individual. This produces an overgrowth of a

kind that is not only almost valueless, but a distinct menace and an evil example. In the exercise of the limbs we may divide the kind of energy into those of swiftness or speed and power, which may be again divided into the combination of both swiftness and power. In acts of muscular swiftness we have a very intimate connection between the motor centre and mechanism in which the centre is more exercised than the limbs in proportion as we try to produce accuracy of movement. In any muscular action involving mere power, as, for example, lifting a dead weight, there is very little effect produced upon the motor centre, but the strain is directly upon the muscle used, collateral muscles acting with this, the tendons and framework, and particularly the heart and peripheral vessels. In acts which involve both force and swiftness along with accuracy, there is a large complexity in the physiological act and the most wide-spread strain upon the mechanism, as, for instance, rowing a boat as rapidly and as long as possible. There is again another form of muscular activity which involves a very considerable strain, but which is too often overlooked, and that is the physical tension illustrated by the perfect muscular equipoise of a cat lying in wait for a mouse, in which almost every muscle of the body is used, controlling the nervous mechanism including the brain, which here is in a form of concentrated tension. This latent energy produces very considerable fatigue, and directly in proportion to the degree of excitement and concentration of attention. It is familiar to all, and most of us can appreciate how fatiguing it is to stand for a long time, or to hold on to an object, as even a baby in the arms, the tiller of a boat, or the reins while driving a horse. The strain is doubled by an excitement which may again be greatly exaggerated to the hypersensitive or over-conscientious person in the performance or continuance of an act. It is not so familiar, perhaps, but equally important to realize and prevent that sort of fatigue which is liable to occur in those who must remain quiet, but who excite themselves by carrying out conspicuous acts of another in their minds while watching them. For instance, an excitable person looking at a match game of football, influenced by eagerness for the success of one side, involuntarily puts forth an immense degree of energy by his desire to help along the others. Indeed, I have known of invalids, who, while watching such contests where one of their own family was contending, became seriously exhausted by just this sort of passive strain or expectant attention.

It should be borne in mind that there is a distinct physiological relief produced by the active forms of exercise which results in temporary breathlessness when followed by periods of rest. Physical and mental tension is relieved by profuse sweating; excitement is relieved to a great extent by over-accumulation of carbon dioxide, which is itself a sedative. I am convinced that I have suffered more fatigue from standing watching over the heads of a crowd an exciting foot-ball game than any individual member of those gladiators who had a much freer scope for their activities and were more suitably dressed for their work, and, above all, were properly trained

as well. Free action in a trained athlete is a dear delight; when out of training only is it a distress.

It is well to bear in mind that for children intrinsically weak (it may be both in their muscles and their nervous force), and whose organs may also be much below the average power of their other parts, muscular exercise must be hedged about with many safeguards and thoughtful modifications. It is doubtful whether such children should be even given much special exercise for their muscles alone, such as pulley-weights, dumb-bells, and gymnastic efforts, unless these be of the lightest and in combination with other things, while it is equally important that they should not be allowed too large a scope for exercises of a complex nature. Deliberate and continued acts of which carpentering and gardening are familiar types are the best. Indeed, the use of tools, involving as it does interest to the mind, is second to none in value for young or old, weak or strong. Complex exercises, involving both force and swiftness, should be gradually worked up to. The most perfect form of gradual approach is in the form of regulated exercises devised by the Swedes, wherein the muscular acts are reduced to their fundamental principles in force and direction; and in the hands of a skilful operator a person is led step by step from the simplest acts to the most complex and forceful ones, and during this process the organs also grow accustomed to the graduated strain. When the individual is vigorous enough to perform little acts of skill, incentive is thereby added and the muscular work is better endured. By and by minor competitions have their place, and so long as these are held in due restraint all is well, and great benefit results from a judicious continuance. If incentive becomes gradually merged into excitement, then a peril threatens. Exciting competitions are only for the strong; innocent incentives in the form of music during muscular exercises is often added with advantage. This is particularly the case with the German Turn Verein and Turn Gemeinde; indeed, more than a passing allusion should be made to the Turner Bund, which in this country is now a very large and wide-spread factor and almost always for good. Here twice a week, as the custom is, the people come together, from the very young children—not babies, of course—to quite elderly people in their separate classes, doing work suited to their capacities, and usually to the sound of music, take a good hour's exercise, which being done together involves a little competition of individual skill and social intercourse.

Dancing is a most wholesome exercise if only it be not superadded to or grow into undue excitement. Fancy dancing for girls is of special value, graduated, of course, as it brings out the graces as well as strengthens the muscles, teaches equipoise, and especially benefits the loins and back, the weakest place, and usually the most undeveloped part in females.

¹ See article by author elaborating the subject on "Puberty in Girls." *Pediatrics*, July 15, 1896.

DEVELOPMENT OF THE NERVOUS SYSTEM.

The development of the nervous system has points of similarity to the growth of a bank account, is subject to somewhat the same variations; at times inadequate, again fairly sufficient, on extreme occasions running so low as to come to the verge of being overdrawn, but under no circumstances can it be excessive. Nervous force grows most satisfactorily by slow and economical degrees; excitements of all sorts are perilous, inducing a waste in one way or another, and only robust natures accumulate enough to squander, lest, peradventure, the account be suddenly overdrawn and bankruptcy ensue. It is popularly admitted that the world is swayed by vigorous nerve force. Language is replete with terms, making nervous energy synonymous with courage, endurance, wisdom, and all those factors, in short, which are embodied in the term "success." It is alone the lack of nervous force which sometimes makes inefficient an otherwise sound bodily organism. On the other hand, a feeble construction, endowed with vigorous nervous force and energy, constitutes an efficient engine. An adequate accumulation then of energy in the nerve-cells and centres is the very fountain and mainspring of life. As we possess little or much of this are we useful beings; whether our actions are mainly mental or physical it is the same. When this energy is exhausted or run down, it must be wound up again, but, unlike the clock, it requires a long period of time to accomplish. Moreover, during this time all the vital organs tend to deteriorate structurally while this controlling force is withdrawn. To acquire nervous vigor its growth should suffer few and small interruptions. We see among country folk, laboring men, and savages, natures which are relatively little disturbed by protracted drains on their vitality, especially of the kind which induces physiological irritability in more complex beings, and this is due largely to their slow growth and simplicity of life, slowly storing up cellular energy. Such folks become not only well filled with force, but tenacious of it and well balanced. If their store be drawn upon they can well sustain the tax. Children whose lives are one long monotony may not be so bright and alluring, but are far more stable, better able to labor and endure. Their observation is simpler and slower, but their concepts and inferences are apt to be clearer. This storing up of vital energy should begin before birth. The about-to-be mother should sacrifice something to enable her to live quietly and healthfully. A vast deal of harm would be avoided as well as trouble to the mother and anxieties for her child if this prenatal period could be spent under natural and wholesome conditions. We have scarcely begun to know much about maternal impressions, but they are of deeper influence and significance than can yet be explained. Hurtful impressions are thus transmitted beyond a doubt, and beneficent ones even more truly and constantly. It is conceded that the finest known specimens of children are found among the British nobility, and, as has been said elsewhere in this paper, our insular cousins are more enduring

than we, certainly in physical competitions, as in long-distance running. The conditions of their early growth and development are hedged about with unusually wise safeguards. If, as has been objected by sentimental observers, these children see less of their parents than those of humbler folks, they are provided with the best possible substitutes in the way of care-takers and teachers; they are reared under the most perfect conditions as to surroundings, almost altogether in country places; whereas those children who are compelled to live with their parents—who, having a good many demands upon them, are unable to devote their best energies to the care and instruction of their offspring—are liable to grow up hap-hazard, and fall into many dangers, in spite of the best affection and intentions. Indeed, there is a very great peril to a child who is provided with too much or too solicitous affection from unwise parents, and, although home influences are inestimable in the way of character growth, nevertheless the exigencies of modern life too often call away the best energies of the parents, and children come in for what is left. A word may be said in passing of children who are backward mentally, a condition which frequently is only relative, being a state of instability of the nervous equilibrium, from which good or evil results may follow, depending upon the same conditions which help or prevent the growth of the nervous force in the body elsewhere. By far the most important considerations have to do with the acquirement of physical invigoration. If mental feebleness be once recognized, it is beyond measure important for the parents to seek skilful advice and to follow it closely. The education of the mind and of the body should go hand in hand, and all forced forms of mental training should be avoided. If the parent is able and willing to be the care-taker, and spend a good deal of time in the open air, especially the fields and barn-yard, thus insidiously teaching and moulding both mind and body, sharpening observation, and aiding in the formation of clear mental concepts, immense good can be accomplished, and not seldom the prevention of serious mental warping.

DEVELOPMENT OF MIND.

It may seem scarcely necessary to speak of the development of mind in pursuance of the subject of this paper; nevertheless, it is important that a few remarks be made as tending to show the connection which the brain and its processes have with enfeebled bodies. We occasionally see precocious minds endowed with very feeble envelopes. If such brains are over encouraged they are capable of using up too readily what little residual vigor there is in the entire organism. Precocity is a manifest peril; it is always of doubtful value; the very abnormality is evidence which should put us on our guard that we should aid in preserving not only the organic activities and framework, but, above all, the integrity of the mind itself. Other things being equal, the mind should receive little or no especial attention until the rest of the organism is fairly well repaired and put in working order. Actual instruction had better be delayed, and the teaching should

always begin with the simplest possible object lessons; suggestions such as emanate from well-conditioned, wholesome-minded folk should surround the child, even then keeping very close to simple, uncomplicated truths and their practical application. The method of teaching as outlined by that wise and good man Froebel is the healthiest both for the weak and the strong, and no system has ever been devised which approaches it in wholesomeness, certainly for very young children. Along with physical weakness there is inevitably a certain lack of mental vigor, and this must be particularly borne in mind, no matter how intelligent or bright a child may seem to its admiring parents or worshipping relatives. Mental processes are purely the outcome of physical activities, and there are in history conspicuous instances of great intelligence, and possibly wisdom, pointed out in wretchedly undeveloped bodies, yet such are always open to question, and in the ordinary course of every-day life we certainly cannot assume that this unnatural juxtaposition is probable. Therefore, it must be assumed from the outset that in a feeble body the mind must be handled with unusual delicacy and judgment to enable it to develop according to its possibilities, no matter how highly or hopefully we estimate these. At least the regularity of the organic activities must be fairly good to enable an organ of such astounding delicacy as the brain to grow naturally in size and power, and there must be maintained a very high order of cellular integrity to enable that organ to reach even a fair degree of energizing capacity and delicate differentiation. If this be true of early budding infancy when the whole organism is largely that of a vegetable, and until the time of early adolescence when the brain reaches its normal bulk, it is even more important that from thence on to the time of maturity, which is about the twenty-fifth year, every care be exercised to enable the natural perfection to be reached. When teaching then is admissible for a little one, it is a matter of much difficulty to decide just how much and of what sort this shall be, depending, of course, upon the material with which one has to build. However, the ordinary method of teaching language, and dividing it up into letters and constructed words, leading from thence to the principles of language, and finally to abstract thought, clothed too often in almost incomprehensible phrase, is certainly far from wholesome for those of the weaker sort.

Simple inductive reasoning from natural objects, of their quality, habits, and means of growth, is the sort of thing that should be pursued. The average teacher knows pitifully little about what the mind of man in this budding state is capable of doing. I would urge upon all who have any desire to know the truth to begin by learning what the ordinary concepts of a young child are and how they shape themselves, and how language, as ordinarily learned by them, so misleading, is capable of conveying thought.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

Narrowing of the Pulmonary Artery considered as a Manifestation of Tubercular Heredity. (*Gazette hebdomadaire de Médecine et de Chirurgie*, March 19, 1896.) By Victor Hanot, M.D.

Commencing with the remark that narrowing of the pulmonary artery is commonly looked upon as a cause of phthisis, Hanot reports three cases that seem to lead to another interpretation. The first was a male of twenty-six years; both parents had died of phthisis and he had always been delicate and, in his youth, slightly cyanotic. Examination of the heart revealed a harsh *frémissement* at the base and a loud systolic murmur in the second left intercostal space transmitted towards the middle of the left clavicle. The second patient was a female of twenty-six years, whose father had died of phthisis, and who had suffered from palpitation upon exertion; at twenty she had had an attack of acute articular rheumatism, and the cardiac phenomena were the same as in the preceding case; aside from a slight temporary bronchitis the lungs were normal. The third was a female of sixteen years, whose father had died of phthisis, and whose mother was suffering from the same disease. Two brothers had died of tubercular meningitis in youth. She had always suffered from palpitation, but never had from articular rheumatism; the lungs were intact; the heart presented the same phenomena as in the preceding case. Hanot discusses the possibility of this form of stenosis being similar to the congenital narrowing of the aorta such as occurs in chlorosis, and whether both are not manifestations of heteromorphous tubercular heredity. He believes that this narrowing may have absorbed the whole or the greater part of the inherited tubercular tendency, and that it acts therefore to a certain extent as an element of immunity against phthisis.

Traumatism as a Cause of Gastric Disease. (*Deutsche Archiv für klinische Medizin*, July, 1895.) By Wilhelm Ebstein, M.D.

The author discusses at great length the effect of injuries upon the

gastric mucous membrane. He first reports three cases, in which, shortly after severe muscular strain, such as the lifting of heavy weights, the patients had severe attacks of hæmatemesis, and subsequently developed the symptoms of gastric carcinoma. In one case the diagnosis was confirmed by the autopsy. Ebstein believes that the injury caused a hemorrhagic infiltration of the gastric mucous membrane or of the submucosa, and that the injured area was subsequently digested by the gastric juice. The manner in which the injury is caused is probably the sudden increase of blood-pressure, exerted upon some area of diminished vascular resistance in the gastric tissue. The lesion may even lead to perforation, as occurred in the first of the reported cases. Severe hæmatemesis may, however, occur without ulceration, as in a case that Ebstein observed, and which caused death from secondary anæmia, although nothing but submucous ecchymoses were found at the autopsy. In this instance the aorta was of the chlorotic type. These cases are usually associated with considerable enlargement of the spleen, and arise under the influence of general diseased conditions, particularly as a result of local disturbances of the circulation; and such conditions may even be recognized during life, such as compression of the vena cava ascendens. Two other cases are also reported similar to this except that the hemorrhage did not lead to death. Another group of causes are general injuries to the body, such as occur in severe falls. Ebstein reports ten such cases, three of his own and seven collected from medical literature, and in all of these the symptoms of gastric ulcer developed subsequently. It is not unlikely that they are due to vasomotor disturbances, particularly as the stomach is especially liable to such disturbances because of the tendency to rupture on the part of its vessels and the erosive qualities of the gastric juice. Among further causes of hæmatemesis he includes mechanical, thermic, and chemical injuries, and in illustration of the first he cites a case in which ulcer and perforation were produced by a rusty nail. Regarding the injuries caused by heat, he thinks it not impossible that liquids at a temperature of 50° C. or more may produce gastric ulcer, but only in cases that are already predisposed. In such cases, however, we are only justified in making a diagnosis of hæmatemesis following injury, as it is impossible to be certain that gastric ulcer is always produced.

Investigations concerning the Relation of the Blood-Serum of Healthy and Diphtheritic Children to Diphtheria Toxin. (*Wiener klinische Wochenschrift*, May 28, 1896.) By Johann Love, M.D., of Innsbruck.

About fifteen to twenty cubic centimetres of blood were taken from the arm and allowed to stand twenty-four hours in a cool place. A certainly mortal dose of toxin was mixed with from one-half to one gramme of the serum pro kilo of the animal, and the compound injected into guinea-pigs. In order to determine whether an injection of the healing serum would cause the serum of the individual to acquire antitoxin properties, a boy of

three years was bled, and the serum found to have no antidiphtheritic qualities. An injection of Behring's serum equal to 2000 A. U. was then made, and fourteen hours later the same blood not only delayed death in the guinea-pigs, but actually prevented it. Five cases were next tested to determine whether a prophylactic injection could be recognized, 150 A. U. being employed. The results were negative, and as a further proof of their slight utility one of the children under observation actually had an attack of diphtheria; a very mild one, however. By good fortune, a child, whose serum had been previously examined and found to contain no antitoxic qualities, suffered an attack of diphtheria. Fifteen days after recovery its serum manifestly delayed death in the guinea-pigs under experimentation, and at sixty days it had a distinct antitoxic influence. Love explains the lesser activity of the fifteenth day's serum by supposing that the reabsorbed toxins counteract, to a certain extent, the action of the antitoxins. In two cases where serum had not possessed any antitoxic properties during the course of the disease, antitoxins appeared after recovery, at least in sufficient quantity to delay death. In one case strongly antitoxic serum was found during the course of the disease; but, as in this instance cocci were found in the membrane and desquamation of the skin appeared, it was considered one of scarlet fever.

In two instances virulent diphtheria bacilli were found in the mouths of healthy children, and in both cases their serum was found to have strong antitoxic properties. On the other hand, toxins were found in the blood of a child suffering from a severe attack of diphtheria, that had failed to react to the serum treatment. Love believes that this case indicates the limitation of the value of Behring's serum, as it shows that, where patients are attacked in whom no antitoxin exists, the poison can produce so much injury to the organs that recovery is impossible. Finally, investigation upon two children suffering from indifferent diseases showed that human blood-serum may retain its antitoxic properties unaltered for a long series of weeks.

The Result of the Serum Treatment of Diphtheria in 1895 at the Kronprinz Rudolf-Kinderspitale. (*Wiener klinische Wochenschrift*, May 28, 1896.) By Dr. Zuppinger.

One hundred and sixty cases were tested, of which forty died, nine were moribund when admitted, so that the mortality after treatment was nineteen per cent. The cases were divided as follows:

Pharyngeal type, seventy-two treated, eight died; pharyngo-nasal type, thirty-two treated, thirteen died, of whom four were moribund when admitted; pharyngo-laryngeal type, fifty-six treated, nineteen died, of whom five were moribund. A marked decrease in mortality occurred as the year progressed, being forty-one per cent., twenty per cent., and sixteen per cent. in the first, second, and third periods of four months respectively. In January, seven of thirteen children died; in November, none of fourteen.

The doses employed were high, 2000 to 3000 A. U. in the first twelve hours and 1000 to 2000 more if no beneficial effect was noted in the first instance. No marked sudden result was observed. In some cases the fever diminished, in others it rose, in others it was unaffected. Albuminuria was not affected. Slight paresis occurred in these cases, but no post-diphtheritic paralysis. In no instance did croupous symptoms develop after an injection, and to this degree the extension of the membrane formation was hindered, but in several cases, particularly of the nasal type, the membrane persisted for days. In twelve cases laryngeal stenosis subsided after the injection without operation. This was an exceedingly rare occurrence in earlier years. The intubation period in the other cases was much shorter than in the ante-serum period. Cardiac paralysis, however, was more frequent in severe toxic cases than in previous years. In seven septic cases the serum was wholly without effect. In three it failed to prevent the formation of membrane in the stomach. The percentage of death, according to the day upon which treatment was commenced, is as follows: of those injected on the first day, ten per cent.; on the second, fifteen per cent.; on the third, twenty-eight per cent.; later, thirty-one per cent. One hundred and twenty-two cases were investigated bacteriologically, forty-five being almost pure cultures, forty-four mixed forms, and thirty-three not showing Löffler's bacillus. The mortality of the first group was thirty-seven per cent.; of the second, thirteen per cent.; and of the third, twenty-one per cent. The thirty-four autopsies showed that the commonest causes of death were complications in the lungs and bronchi and degeneration of the heart and kidneys. Of twenty-nine children that had been exposed to contagion and were inoculated prophylactically, one was attacked, but it is likely that the disease had already commenced. In conclusion, Zuppinger does not hesitate to declare Behring's serum by far the best treatment yet discovered for diphtheria.

[The article is very carefully and logically written, and is probably the most impartial statistical study of the results of the serum treatment that has yet appeared.]

Immunization against Serpent's Venom. (*British Medical Journal*, April 18, 1896.) By Professor Fraser, M.D., LL.D., F.R.S., of Edinburgh.

The serum of a horse that had received a dose of cobra serum representing twenty times the minimum lethal is fluorescent, and when dried yields about ten per cent. of solid residue, which retains its antivenomous properties unchanged for an indefinite length of time, and can be readily restored to its original liquid state by dissolving in water. With this preparation four series of experiments were performed. In the first it was mixed with the cobra venom outside the body and the mixture then injected. The results showed a remarkable accordance between the increment required in the dose of antivenene and each increment in the dose of venom, amounting to

about .3 cubic centimetre per kilo of body-weight for each unit from twice the lethal dose upward. It is apparently possible by this method to prevent the fatal effects of almost any dose of venom. In the second series the venom and antivenene were injected separately but simultaneously, and it required 3.5 cubic centimetres per kilo of antivenene to prevent death from one and one-half times the lethal dose of venom. In the third series the antivenene was injected thirty minutes before the venom, and the protective quantities were less than those required in the second series. In the fourth series the antivenene was injected thirty minutes after the venom, and not less than five cubic centimetres per kilo were required for twice the minimum lethal dose. Fraser concludes that it is impossible not to believe that the reactions are chemical and not physiological when the great difference between the effects of mixture *in vitro* and separate injection are considered, and that the antivenene directly neutralizes in some manner the toxic principles of the venom.

Venom, sometimes in enormous doses, was next administered by the stomach to white rats and to a cat without producing any symptoms whatever; but the animals subsequently exhibited considerable immunity, resisting one and one-half times the minimum lethal dose, and it was discovered later that the cat had communicated this immunity to her suckling kittens. It thus appears "that serpent's venom introduced into the stomach in large quantity, in a quantity which, if injected under the skin, would kill one thousand animals of the same species and weight, while it failed to produce any definite symptoms of poisoning, nevertheless produced in a few hours complete protection against the lethal effect of a dose of venom more than sufficient." That the same result holds good of the human race seems indicated by a personal observation of Mr. Alfred Bolton. The serum of the serpents themselves, notoriously immune to their own poison, was next tested, and found to possess strong antitoxic properties, either when tested against the venom of other serpents or their own. In conclusion, Fraser regrets that no proof is yet at hand of the practical value of antivenene in human beings; but suggests that, in spite of the large dose required,—about three hundred and fifty cubic centimetres,—it should be employed, and if possible, in connection with ligation, should the bite affect a limb. In such a case it should be injected both above and below the ligature.

A Fatal Case of Pancreatitis with Hemorrhage. (*Lancet*, March 14, 1896.) By Dr. Rolletson.

The patient had had two severe attacks of epistaxis, but had otherwise always been perfectly healthy. Without any prodromal symptoms, whilst at work, he was suddenly seized with intense abdominal pain; this improved only to recur more severely, and later there was scanty bloody vomit. Upon admission, aside from slight distention of the abdomen, there were no abnormal physical signs. He complained of pain around the lower border of the ribs, in the umbilical region, and particularly in the small of the

back. There was slight tenderness upon pressure midway between the ensiform and umbilicus. The bowels did not move and the urine was normal. Death occurred in collapse. At the autopsy a retroperitoneal blood-clot was found, infiltrating the tissues in front and below the pancreas and covering the kidneys and adrenals. Several ounces of fluid like milk [chyle?] were found enclosed in the sac of the omentum. A white, opaque putty-like material was found lying between the lobules of the pancreas, and this proved to be necrosed fat. There was no peritonitis. [Unfortunately, the case has been so carelessly studied that it fails to add to anything but the statistics. The source of the hemorrhage, the nature of the milky fluid, and a bacteriological examination would have added much to its value. Clinically, it seems very possible to diagnose the condition during life, and we have observed two cases in which such a diagnosis was made and proved by the autopsy to be correct.]

Polymyositis Acuta, with Report of a Case presumably of Syphilitic Origin (Myositis Syphilitica). (*American Journal of the Medical Sciences*, April, 1896.) By James Herrick, M.D.

The patient was a Norwegian, twenty-four years of age, whose husband had had syphilis, and who had herself had some tertiary manifestations. The disease commenced with swelling in the right forearm, and later both calves were attacked; the swelling was either circumscribed or diffuse, and very painful. Although the tissues appeared œdematous, there was no pitting upon pressure, and only slight reddening of the skin. The patellar reflexes were exaggerated. On incision into the left gastrocnemius a light brownish-red fluid escaped containing fragments of old blood-clots. Bacteriological examination of this fluid and of the excised muscle were negative. Improvement, which had begun without treatment, continued rapidly after the administration of the iodides, and subsequently there was no trace of muscular atrophy. The excised muscle exhibited extensive and diffuse inflammatory change, with hyaline degeneration.

The Diaphragm Phenomenon. (*Medical Record*, December 28, 1895.) By Dr. Litten, of Berlin.

Litten defines the phenomenon as "the visible expression of the gradual detachment of the diaphragm from the walls of the thorax, and its gradual opposition to the thoracic walls while it rises during expiration." This physiological movement is plainly marked upon the thoracic wall by the regular rising and falling of a peculiar shadowy line, caused by the motion of the diaphragm and denoting its momentary position, and this line may be seen upon the chest of every individual, healthy or diseased, unless morbid processes be present that interfere with the motility of the diaphragm. The appreciation of the shifting of the respiratory organs is greatly increased by this phenomenon. The normal excursion of the diaphragm amounts, on the average, to from two and two-fifths to two and four-fifths inches. A smaller

excursion usually indicates emphysema, and the position of the diaphragm is one or two interspaces farther down, or even as low as the costal margin. In general debility the excursion is less, but the diaphragm is normal in position. It is in unilateral disturbances that the method achieves its greatest triumphs. If the phenomenon is absent on either side and normal on the other, there is either a considerable effusion of air into the affected pleural cavity or pneumonia of the lower lobe. In case of serous effusion, slight motions of the diaphragm are often visible abnormally far downward. In extensive attachment of the diaphragm to the lungs, spleen, or liver, and especially in cicatricial retractions of the thorax, the movement is much restricted. An area of dulness in the lower part of the thorax, not due to the liver or spleen, with the phenomenon visible above the dulness but diminished in extent, indicates a subphrenic abscess. In intrathoracic tumors the diaphragm, if visible, is very low, and it is usually invisible where there is extensive ascites, diffuse peritonitis, or considerable meteorismus, although it can be observed where there are large tumors of the spleen or liver. In a case of acquired diaphragmatic hernia, the phenomenon was visible below the tympanitic area. The method is particularly useful in judging the condition of the lungs after pleuritic effusions and injuries, and of the effects of treatment in these conditions and emphysema.

A Case of Diffuse Phlegmonous Gastritis. (*Lancet*, March 14, 1896.) By T. M. Kelynack, M.D., of Manchester.

The patient had suffered from occasional dysphagia and vomiting for five years. Examination revealed a non-painful stricture of the œsophagus just above the diaphragm. There was slight rise of temperature and collapse followed by death. At the autopsy a fibrous stricture was found in the lower part of the œsophagus, riddled with sinuses, with a large submucous abscess just above it. The wall of the stomach was thickened and an abundant sero-purulent exudation oozed from the cut surface upon gentle pressure. Microscopically there was a purulent infiltration of the deeper part of the mucosa and especially in the submucosa. There was evidence of degenerative changes in the muscle-cells. Sections stained by Gram's method showed numerous short rod-like organisms, resembling the bacillus coli communis.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

Treatment of Diphtheria by Hydrochlorate of Pilocarpine.
(*Wratsch*, Nos. 45-48, 1895.) By M. S. Barsky.

The author reports the results of observations made in a recent epidemic of diphtheria. Out of ninety-five cases, thirty-one have ended fatally; the epidemic, then, was quite severe. Out of these patients forty-eight were treated by pilocarpine alone, and only eight died; out of seventeen patients treated by serum and pilocarpine at the same time there have been only three deaths; lastly, out of twenty-four cases not treated, there were nineteen deaths.

Again, out of sixteen cases not treated, there were fourteen deaths, whilst out of twenty-three cases of equal gravity in which pilocarpine was used, only seven patients were lost.

Under the influence of this remedy the local phenomena are ameliorated; five or six hours after the injection and following abundant salivation, the coats soften and the false membranes are thrown off. It is rare for the false membrane to reappear; in two or three days the pharynx is completely cleansed. The general condition becomes better at the same time. The author has seen no accident directly established by pilocarpine. Pilocarpine may be advantageously employed with serum, since the latter acts against the Klebs-Löffler bacillus alone, whilst the former gives favorable results in the case of mixed infection.

The curative effects of pilocarpine are explained by the following facts: First, in increasing the secretion of saliva, pilocarpine favors the softening and the detachment of the false membranes, and removes the bacteria from the mouth mechanically; second, under the influence of pilocarpine the saliva becomes acid; now, this is an improper medium for the development of the diphtheria bacilli; third, the increased perspiration and the increase in the secretion of saliva and of mucus favor the elimination of toxins; fourth, pilocarpine gives rise to leucocytosis.

For the internal administration of the drug the following formula may be employed.

R	Pilocarpin. hydrochloratis,	0.02	gr. $\frac{1}{2}$
	Ammonii carbonatis,	1.00	gr. xv.
	Potassii hydrochloritis,	2.00	ʒss.
	Aquæ destillatæ,	60.00	ʒij.
	Spiritus vini gallici,		
	Syrupus senegæ, aa	30.00	ʒj.—M.

Of this mixture may be given every hour a teaspoonful, a dessertspoonful, or a tablespoonful, according to the age of the patient.

In severe cases a beginning may be made by injecting a quarter of a syringeful of a two-per-cent. solution of pilocarpine, and then, to keep up the action of the drug, it may be given by the mouth. If there is no improvement at the end of twenty-four hours, another injection is given; but the author has not had to give more than two. In case pilocarpine is to be associated with antidiphtheritic serum, the pilocarpine should be given hypodermically and by the mouth at once, and the serum should be used the following day if there is no improvement. The author has never had to use local treatment.—*Gazette des Hôpitaux*, April 28, 1896.

The Presence of Arsenic in Cigarettes. (*British Medical Journal*, July 11, 1896.) By William Murrell, M.D., F.R.C.P., of London.

In a preliminary report of investigations made by Dr. Murrell and his colleague, Dr. Hale, both of Westminster Hospital, as to the presence of arsenic in cigarette-wrappers,¹ the following interesting results are presented. The tests were based mainly on those of Reinsch and Marsh, though these were checked by others. In some instances a dozen or more tests were made of the same brand of cigarette, to avoid possibility of error. Where the papers were of complex design or printed in more than one color, different portions of the wrapper were separately examined. "Inserts," such as pictures painted in colors, were also closely tested. Tobacco in tins was also submitted to examination. The opinion is positively given that the color of the paper affords no indication of the presence of arsenic; indeed, notwithstanding the general belief that green papers contain this drug, many of that color are free from it. In proof of this statement, Dr. Murrell's tests of wrappers of vivid green, bright bluish-green, pale-green, and bright green cases showed no trace of arsenic; this, however, is to be contrasted with a test of the bright green wrappers of tobaccos, of cigarettes, the bright green cases of cigarettes, and the very pale bluish-green wrappers of the same, which contained arsenic; still further, the bright yellow paper of tobacco, and the blue, red, yellow, and gold wrappers of cigarettes, as also the blue, buff, white glaze, and blue satin cases, contained no arsenic. Out of seventeen series of different kinds of cigarettes and tobacco, arsenic was present in the labels of six, or more than a third. The arsenic in these cases was present in such large quantities that no difficulty was experienced in demonstrating the fact. The report closes with the conclusion that the presence of arsenic in these wrappers of cigarettes must be attended with considerable risk, as the coloring matter, especially when moist, rubs off on to the fingers, from which they are transferred to the cigarette. In most cases in this industry the cases and papers are spread by girls, who must therefore of necessity absorb a good deal of the arsenic. The danger is clearly both to the consumer and manufacturer. Moreover, the presence of

¹ By the term "wrapper" is meant the colored case or packet in which the cigarettes are sold, not the rice-paper in which the tobacco is rolled.

arsenic is not at all confined to the cheaper brands, as it occurs abundantly in the higher-priced packets. The report also suggests that, as the inhalation of arsenious acid even in minute quantities for a considerable time produces cough, hæmoptysis, expectoration, and loss of flesh, which are readily mistaken for phthisis, the advantage of accurate knowledge concerning this subject is most apparent.

Permanganate of Potassium in Opium-Poisoning. (*British Medical Journal*, June 13, 1896.)

Vutchetitch (*Srpski Archiv za Tzelokupno Lakarstvo*, Nos. 2 and 3, 1896) relates a case of severe opium-poisoning in a boy two and a half years old, who accidentally swallowed "from twenty-five to fifty drops" of tinctura opii simplex (Ph. Germ.). About an hour later the writer injected subcutaneously a Pravaz syringeful of a one-per-cent. solution of potassium permanganate, and simultaneously gave the boy a teaspoonful of the solution internally. The subsequent treatment was limited to an internal administration of the antidote in the same dose hourly, and later on every two hours. About fifteen hours after the poisoning the child was found playing with other children, though looking somewhat pale and dull. On the next day the boy was quite well. The Servian paper contains an exhaustive analysis of international (British, American, German, Austrian, Russian, etc.) literature on the subject.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D.,

AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the University of Pennsylvania,

Medical Superintendent of the Presbyterian Hospital.

A Case of Arrest of the Heart's Action and of Respiration during Chloroform Anæsthesia; Bleeding from Internal Jugular Vein; Recovery. (*British Medical Journal*, July 18, 1896.) By H. F. Waterhouse, M.D., and Charles Gibbs, M.D.

S., aged seventeen, was suffering from tuberculous disease of the glands of the right side of the neck. Examination of the heart and lungs found them to be normal, and removal of the affected glands was recommended. Chloroform was administered on a Skinner's mask, and the operation was undertaken. Chloroform was selected on account of the patient's youth, his heart being healthy, and also because of the existence of post-nasal vegetations which it was feared ether would cause to increase. For the first forty minutes of the operation everything went well. But just at the time

when all the diseased glands seemed to have been enucleated, the patient, who had been breathing quietly and evenly, made three attempts at retching. The mask was sprinkled with chloroform and reapplied for not more than thirty seconds, when suddenly the patient became very pale, though blue about the lips; the pupils dilated widely, the pulse ceased, and respiration stopped after three shallow inspirations. The heart's action ceased some seconds before respiration failed. The patient's mouth was immediately opened by a Mason's gag, the tongue drawn well forward with forceps, the foot of the operating-table raised to an angle of forty degrees, and artificial respiration performed about twenty times per minute by compression of the lower chest. At the same time brandy was injected by the nurse. No effect was produced, and to all appearance the patient was dead, and so considered by every one in the room. The doctor now determined, as a last resort, to open the internal jugular vein and compress the lower chest, to relieve the distended right ventricle. Several ounces of blood rapidly escaped, and after the jugular had been clamped by two forceps, artificial respiration was resumed. In less than half a minute the patient made a faint inspiration, followed in a few seconds by another, and, artificial respiration being continued energetically, the heart was heard to beat, at first slowly, but soon the pulse and respirations gained in strength and frequency. The operation was now completed without further administration of an anæsthetic. This case is deemed of importance, as demonstrating that the bleeding from the internal jugular vein, by relieving the distention of the right heart, was the main factor in bringing about the recovery of the patient from an apparently hopeless condition, and it is believed that the treatment applied here with such success should be tried by surgeons in similar cases where artificial respiration alone has failed to revive the patient. The essential point seems to be that the veins to be opened should be as large and near to the heart as possible, in order that the issuing stream of blood should be of considerable volume and the relief to the heart as rapid and thorough as possible.

On the Treatment of Inoperable Cases of Carcinoma of the Mamma by Removal of the Uterine Adnexa and Administration of Thyroid Extract. (*Lancet*, July 11, 1896.) By George Thomas Beatson, M.D., Edinburgh.

Dr. Beatson gives a detailed account of three most interesting cases of mammary cancer. The woman had had the left breast excised, and a large area of skin free of tumor had been taken away. The patient left the hospital almost well, seeming to have made a good recovery. About a month thereafter she noticed an opening of the wound, with discharge and shooting pain. She returned to the hospital for further advice and was again received for a few days, but was then discharged, and it was thought an operation would be useless. The journal report was as follows: "Dismissed. General involvement of whole scar by large tumors, cancerous in

nature, to remove which entirely was thought to be impossible. Adherent axilla and chest walls. One of the wounds from the recurring secondary tumors has given way, and there is now an ulcerated surface." The case having been placed in Dr. Beatson's care, an opportunity was afforded him to test practically his views of the nature and etiology of cancer, which are entirely opposed to the local parasitic theory of the disease. The author agreed fully with the opinion expressed at the Royal Infirmary, the hospital referred to, that local removal was unjustifiable. But he asked himself, could the disease be attacked by any other channel? Is cancer of the mamma due to some ovarian irritation, and if so, would cell-proliferation be brought to a stand-still, or would the cells undergo the fatty degeneration seen during lactation, if the ovaries were removed? With the view that in inoperable cases the administration of thyroid extract might influence the growth and work in time a cure, he commenced this treatment, but after a month perceived no appreciable effect. He then decided, on the lines of his theory that the ovaries and tubes were in some way concerned in the development of the growth, to perform the operation of removing the tubes and ovaries. The operation was done on June 15 of last year; the right ovary seemed healthy, the left one was somewhat cystic. The patient made a good recovery, and on June 28 was sitting up. No local application was made to the diseased areas on the thorax. They were simply kept clean with boric lotion and dressed with protective and boric lint. On July 12 the administration of the thyroid tabloids, three daily, was resumed, it being probable that there was present an amount of cancerous material which a powerful lymphatic stimulant like thyroid extract might remove. On July 19, five weeks after the operation, marked improvement was noted, the tissues being softer and more pliant. On August 12 the local improvement had still continued; the patient's general health was satisfactory, and she was allowed to leave the vicinity, to report from time to time. On October 12 the woman reported herself as feeling very well, and looked so. She was taking four- or five-grain tabloids of thyroid extract daily. Eight months after the operation the doctor was able to show her with a sound cicatrix and healthy thoracic tissue, and apparently in good health.

The next case reported by Dr. Beatson was of a woman aged forty, with a large tumor of the right mamma. Her family history was satisfactory, menstruation had commenced at thirteen, and still continued. The tumor was densely and uniformly hard, and adherent to the skin over a large area. She also had applied to a hospital, but admission was refused, as operation was considered inadvisable. Dr. Beatson was of the same opinion, as the disease was evidently carcinoma. An unfavorable feature of the case was the implication of the glands, not only of the neck but of the axilla. The tubes and ovaries were removed, the operation not being an easy one, owing to the adherent uterine adnexa. Recovery, however, was uninterrupted. This case was also treated with five-grain thyroid tabloids twice daily, and in five weeks after operation the neck was freely movable in any direction.

A third case was that of a woman aged forty-nine, with cancer of the left breast, which had been eaten away almost as if removed by excision. As her menopause had occurred two years previously, it was not deemed advisable to remove the tubes and ovaries, but administration of the thyroid tablets was resorted to. No marked effect on the sore has up to date been observed, and removal of the ovaries and tubes, notwithstanding the occurrence of menopause, may yet be done, in which case the doctor will report the effects.

The conclusions drawn from these cases are: 1. That there seems to be evidence that the ovaries and testicles have control in the human body over local proliferations of epithelium. 2. That the removal of tubes and ovaries has effect on the local proliferation of epithelium which occurs in carcinoma of the mamma, and helps on the tendency which carcinoma naturally has to fatty degeneration. 3. That this is best seen in cases of carcinoma in young people,—a class of cases where local removal of the disease is often unsatisfactory.

The Detection of Spinal Caries by the Röntgen Process. (*British Medical Journal*, June 6, 1896.) By Noble Smith.

The author speaks of the value of skiagraphy in obscure cases of spinal caries, and cites two cases in which the process was especially serviceable to him. One was a boy of five and a half years, with persistent contraction of the right sterno-mastoid muscle, with a lateral curvature of the cervical spine and some œdema of the neck. The absence of caries of the spine is clearly shown in a skiagram taken by Mr. Sydney Rowland.

The second case was that of a young woman of twenty-seven years, who complained of severe pain in the cervical and upper dorsal regions upon the least movement and a choking sensation upon attempting to swallow. The symptoms had been attributed to hysteria. The skiagram showed distinctly severe disease above the fourth cervical vertebræ.

Mr. Smith concludes by stating that this diagnostic process must be most applicable in the neck, for except in very young children the obstruction caused by the sternum and other dense tissues interferes with a satisfactory shadow of the vertebræ.

A Method of temporarily closing the Opening after Gastrostomy or Enterotomy. (*British Medical Journal*, June 6, 1896.) By Harrison Cripps, F.R.C.S.

Mr. Cripps makes use of a circular disk of sheet rubber about the thickness of a silver quarter, through which he passes, a little to one side of the centre, a thread of No. 4 silk. The thread is passed back again at a little distance from the original puncture. The two ends of the thread are now parallel and are left about six inches long.

The disk is made into a circular roll and kept in this position by the jaws of a pair of hæmostatic forceps. The roll is then introduced length-

wise through the opening into the bowel or stomach, and when released from the forceps immediately expands to its original circular form. By drawing up the two strings the disk is lifted against the mucous surface and effectually stops anything coming through. The disk is kept in position by tying the two ends of the silk thread over a roll of lint the thickness of a pencil and stiffened with a wire or pin. The roll is laid crosswise over the external opening.

For feeding the patient or obtaining relief all that is necessary is to untie the thread, remove the roll of lint, and, holding on to the thread lightly, push the disk back into the bowel with a director.

The author states that he has found this method absolutely effectual in keeping patients dry and clean.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D.,
New York City,

AND

WM. G. SPILLER, M.D.,
Philadelphia.

Concerning Cavity-Formation in the Medulla Oblongata and the Anatomical Bulbar Lesions in Syringomyelia. (*Arbeiten aus dem Institut für Anatomie und Physiologie*, edited by Professor Obersteiner, No. 4.) By Hermann Schlesinger, M.D.

Dr. Schlesinger draws the following conclusions:

1. The formation of cavities in the oblongata may occur in a neoplasm or without important neoplastic change in the tissues.

2. The latter form may be found in connection with syringomyelia or as an independent bulbar affection.

3. The bulbar cavities or streaks of neuroglia are in typical positions.

(a) Those laterally situated usually extend from the hypoglossal nucleus, or from the area to the outer side of this, ventrally and laterally in the direction taken by the roots of the vagus, and reach as high as the lower end of the pons.

(b) Those situated mesially lie exactly in the middle line and extend as high as the beginning of the fourth ventricle.

4. On account of the typical locations of the cavities typical lesions are produced. From the lateral position these are: degeneration of the lemniscus, of the restiform body, of the spinal roots of the ninth, fifth, and eighth nerves, and of the direct cerebellar tract, very often also unilateral degeneration of the bulbar nuclei of the lower portion of the oblongata, the olives, and the pyramidal tracts.

5. The involvement of the pyramidal tracts may be explained in great part as retrograde degeneration of the central fibres of the cranial nerves.

6. The cavities in the lateral portion of the oblongata may possibly be caused by lesions of the vessels. In favor of this view are morbid findings (softening, hemorrhage in this part), experiments in the injection of the vessels, the constant changes found in the vessels of the oblongata near the cavity. The loose formation of the tissue in this portion predisposes to the affection.

7. Errors of development play an important rôle in the formation of the mesially situated cavities.

8. When clinically certain bulbar nerves escape and others are involved hydrocephalus and tabes must be thought of as complicating processes. Often when the third and fourth are paralyzed or the optic nerve is involved, a complication of syringomyelia with some other anatomical process may be thought of.

9. The bulbar affections in syringomyelia, even the bilateral, may easily be distinguished anatomically from those in tabes.

Pathology of Multiple Sclerosis (clinical portion). (*Wiener klinische Rundschau*, 1895.) By Emil Redlich, M.D.

Multiple sclerosis has usually a very chronic course; the average duration is from eight to ten years. In a few cases death has occurred within a short period. The disease may show a series of acute attacks, separated by periods of remission; in such cases the pathological findings consist of acute destruction of tissue or acute degeneration about chronic foci. Some of the symptoms are due to functional disturbance. Many of the axis-cylinders are preserved, as is well known. Redlich is not inclined to believe in the restoration of fully degenerated central nerve-fibres, although recovery may occur after slight changes in the axis-cylinders and destruction of the medullary sheaths. Hemiplegia, which may be the first sign in apparently healthy individuals, following which the other symptoms develop, or which may occur in the course of the disease, and, as a rule, is of short duration, although in some cases lasting a considerable time, is supposed by many to be due to vascular conditions. Redlich believes that in most cases the cause is to be found in sclerotic foci in the pons or oblongata, which are not uncommon in multiple sclerosis, whereas such foci are rare in the cerebral cortex and internal capsule. In many of these cases the cranial nerves are involved, a fact which favors this theory. The hemiplegia is due to degeneration of the medullary sheaths of the pyramidal fibres, which for a time interferes with the function of the axis-cylinders.

The intention tremor is a sign of weakness, conduction of impulse is possible, but promptness of movement is impaired. It may be compared with the tremor seen after exhaustion. It is not the same as ataxia. It is, therefore, impossible to assume a lesion of any one distinct region as the cause of it; the same may be said of the nystagmus, although it seems that this is probably due to involvement of the central fibres of the nerves to the eye-muscles.

The defects of speech are due to involvement of the nuclei in the oblongata, and, although these centres control also the muscles of expression, deglutition, etc., the highest function—speech—suffers first, later the symptoms of progressive bulbar paralysis may be noticed, and the autopsy reveals in such cases extensive involvement of the oblongata and pons, as shown among others in two cases examined by Redlich.

The symptoms of transverse myelitis may develop acutely in the course of multiple sclerosis, or may be the only ones indicative of the disease, and the microscopic examination shows in such cases acute changes in the thoracic portion of the cord. It is questionable whether there is a purely spinal form of the disease. When the symptoms of transverse myelitis appear, even acutely, in youthful vigorous persons, and there are no signs of caries or syphilis, disseminated sclerosis should always be thought of, even when the ordinary signs of the malady are absent.

Redlich reports a case of spastic spinal paralysis due to foci of multiple sclerosis in the brain and cord. Although there was no secondary degeneration in the pyramidal tracts, marked contractures had been noticed in the lower extremities. Cases of spastic spinal paralysis with optic atrophy are usually due to disseminated sclerosis. Not all cases of apparent multiple sclerosis in which no pathological findings have been observed are to be attributed to hysteria.

Cephalic Tetanus; General Tetanus associated with Hemifacial Paralysis; Recovery. (*University Medical Magazine*, June, 1895.) By De Forest Willard, M.D., and James I. Johnston, M.D.

There have been only three cases of tetanus with the coexistence of unilateral facial paralysis reported in America, and the one recorded by Drs. Willard and Johnston is the first case with recovery in this country. Cephalic tetanus is produced by an injury of one of the cranial nerves. Usually the onset is slow. The severity of the disease is determined by the rapidity of onset and development.

In this case there had been a slight wound from a stick near the inner canthus of the right eye; a week after the accident spastic gait and paralysis of the entire right facial nerve with trismus were noticed. Stiffness of the muscles of the legs, abdomen, back, and neck, with opisthotonos, developed. The slight wound did not suppurate, and no material could be obtained for cultures. The rigidity of the legs became so great that passive movements were almost impossible. Pain was chiefly complained of in the right heel and calf of the leg. The temperature rose at one time to 101.4° F. The reaction of the facial nerves to electricity was not altered to any extent, as tested by Dr. James Hendrie Lloyd. About a month after admission the patient was quiet and rational, there was still slight rigidity, but he could move all his limbs and open his mouth easily. Recovery was perfect after an illness of about two months.

The important features in this case are :

1. General traumatic tetanus of a chronic nature, with recovery.
2. Unilateral facial paralysis, which disappeared with recovery from the tetanus.
3. An insignificant wound involving filaments of a cranial nerve.
4. No markedly asthenic condition or threatened asphyxia throughout the course of the disease.
5. Decided improvement for a week after subcutaneous section of the nerves in the injured area.
6. Origin of the infecting bacillus in the earth, and infection through the eyelid.

The antitoxin for tetanus could not be obtained. The treatment consisted of bromide, chloral, and deodorized tincture of opium, milk diet, an occasional enema, subcutaneous section of the nerve-filaments leading to the cicatrix, and confinement to a darkened, isolated room.

Two Cases of Acute Transverse Myelitis. (*Nouvelle Iconographie de la Salpêtrière*, 1895.) By J. Nageotte, M.D.

These two cases of acute myelitis were clinically and to a certain degree pathologically much alike, but different etiologically. Both presented the symptoms of complete, acute, flaccid paraplegia of the lower extremities with preservation of the cutaneous reflexes, but with involvement of bladder and rectum. Dissociation in the sensory disturbance was noticed in the first case, and in the second complete loss of sensation in the lower limbs and part of the trunk; in both decubitus developed. The head and upper limbs were not involved in the first case; there were symptoms referred to the base of the brain in the second. The microscope showed in both cases myelitis of the thoracic region, from the second thoracic to the eighth thoracic in the first case, and from the eighth cervical to the tenth thoracic in the second. In both the pia was infiltrated in all parts of the cord, but also at the base of the brain in the second. Secondary degeneration was observed in both. From these facts one would be inclined to believe that the two cases were exactly similar, especially as death occurred after five weeks in one and six weeks in the other. The second patient was known to be syphilitic; examination of the liver revealed a cellular infiltration similar to that in the cord. The first patient had had no premonitory symptoms, these had been present in the second case, but the most important difference was in the nature of the infiltration. The cells in the first case contained irregular nuclei, sometimes well stained, sometimes imperfectly if undergoing degeneration, and surrounded by a considerable amount of protoplasm. The infiltration of the second case consisted of cells with round small nuclei surrounded by almost invisible protoplasm. The first was a purulent infiltration, the second is seen in syphilis.

Dr. Nageotte does not believe that abrupt development of symptoms in every case of spinal syphilis is due to mechanical obstruction of diseased vessels: this may be from acute inflammation of the nervous tissue.

A New Cause of Saturnine Intoxication. (*Comptes Rendus des séances de la Société de Biologie*, June 1896.) By J. B. Charcot, M.D.

A woman who had had intense colic accompanied by obstinate constipation visited the Salpêtrière with bilateral paralysis limited to the extensors of the hands. The mouth was kept very clean, so that no blue line was found. She had been engaged in making artificial flowers, and used a large amount of a certain kind of green paper, which she handled with fingers moistened by the tip of the tongue. Analysis revealed a large quantity of lead in this paper. Individual predisposition for lead-poisoning was clearly shown, she being the only one among the workers who was affected.

A Case of Leontiasis Ossea, Megalocephalie, or Hyperostosis Cranii. (*British Medical Journal*, June 6, 1896.) By W. Hale White, M.D.

When three years old the patient fell from a window into the street, and claims that his present deformity dates from that time. Three years ago he first noticed slight stiffness with pain about the right shoulder-joint, and the arm and forearm began to waste. There is no evidence of gonorrhœa or syphilis.

At present there is a very prominent ridge of bone running round the head horizontally. It displaces the auricle downward, the upper margin blends with the general bony surface of the skull, and the lower edge is equally difficult to define. The maximum circumference of the head is twenty-four and one-half inches. The patient is extremely and equally deaf in both ears to bone and ordinary conduction. He is very intelligent. Pupils are equal and react normally; optic disks are healthy and there is slight nystagmus.

The thyroid appears normal; the bones of the face are not involved.

The arm appears to be affected with rheumatoid arthritis and associated muscular atrophy. The patient has no headache and no sensory symptoms. A photograph taken at the age of five shows the deformity of the head very plainly.

The Spinal Cord in Pernicious Anæmia. (*Journal of Nervous and Mental Disease*, April, 1896.) By James Hendrie Lloyd, M.D.

In 1893 the patient had what he described as a severe attack of gastro-enteritis, from which he never completely recovered. Weakness had been gradually increasing for two years, paræsthesia in the legs and girdle sensation about the abdomen had also been noted. There was no ataxia and no involvement of rectum or bladder. When examined in 1894 the knee-jerks and objective sensation were normal, the anæmia was great, the patient was very weak, and attacks of sudden and temporary localized œdema were noted. The patient likewise suffered from irregular diarrhœa. An examination of the blood showed at one period 648,000 red blood-corpuscles to a cubic millimetre, the hæmoglobin became as low as sixteen per cent.,

white blood-corpuscles 3040 to a cubic millimetre, macrocytes, microcytes, many poikilocytes, some nucleated red cells were observed. An examination of the eye-grounds showed numerous hemorrhages.

Microscopic examination of the thoracic region of the spinal cord revealed normal tissue in the posterior columns adjoining each posterior horn and the gray commissure, also along the periphery of the cord. The degeneration was less dense about the posterior median septum. The posterior root-zones were not seriously involved. In the lumbar region the posterior columns were almost normal.

In the lateral columns there was proliferation of neuroglia and some of the nerve fibres were greatly distended; in some of these the axis-cylinders were absent. This distention was considered an early stage of degeneration, probably due to the action of some toxic substance on the nervous elements. The membranes were not distinctly involved.

The author considers that loss of knee-jerk, ataxia, and subjective sensory symptoms probably depend on the degree of destruction in the posterior root-zones.

The range of temperature in this patient indicated the presence of some irritant or toxic substance in the blood; the persistent diarrhoea may also have been of some significance.

The Frequency of Laryngeal Paralysis in Hemiplegia. (*Revue Neurologique*, June 15, 1896.) By Dr. Simerka.

The locality of the laryngeal centre for phonation is one of the most disputed subjects in neurology. The general opinion is that there is a cortical centre and that it is situated at the base of the third frontal and antero-inferior portion of the ascending frontal convolution in each hemisphere. But the opinion regarding the manner in which these centres influence the terminal organ is very different. Some (Masini) suppose that each of these centres acts upon the vocal cord of the opposite side; others (Krause, Semon and Horsley, Broeckaert) claim that each hemisphere acts simultaneously upon both vocal cords. According to Masini excitation of one of these centres causes adduction of the opposite cord, extirpation of one causes fixation in abduction. According to other writers excitation of one centre produces adduction of both cords, while extirpation has no influence on the movements of the larynx, inasmuch as the remaining centre is sufficient for the control.

Raugé demands the reason for the rarity of cortical laryngeal paralysis, as hemiplegia and motor aphasia are so common. If the laryngeal centre occupies a zone similar to that of Broca's, it must be liable to the same vascular lesions, and being bilateral its involvement ought to be twice as common as motor aphasia or as frequent as hemiplegia. Semon and Horsley consider a unilateral paralysis impossible, and believe that a bilateral paralysis occurs only after a lesion in each hemisphere. There are a few well-observed cases with autopsy (Garel, Dejerine) of unilateral

laryngeal paralysis from a limited cortical lesion, for which reason Raugé refuses to accept the view of Semon and Horsley, and considers cortical laryngeal paralysis rare because not observed.

Pierre Marie has chosen cases of hemiplegia associated with disturbances of speech, especially with dysarthria, or with dysphagia or paralysis of the soft palate, as these gave more reason to expect involvement of the larynx. Dr. Simerka has examined these twenty-three men. The time which had elapsed since the attack varied from one to eighteen years. In nineteen of these cases no involvement of the vocal cords was observed; in four there was less movement of the right cord in respiration and phonation, causing a deviation of the glottis towards the left side. Three of these patients had right-sided, the fourth left-sided, hemiplegia, all four presented contractures and dysarthria. The trouble might be considered a paresis of the abductor or hyperexcitation of the adductor muscles. The location of the lesion might be cerebral, bulbar, or peripheral.

These investigations show that laryngeal paralysis is not uncommon because overlooked, and are confirmative of the view of Semon and Horsley.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

A Rapid and Convenient Method of Preparing Malarial Blood-Films. (*British Medical Journal*, July 18, 1896.) By Patrick Manson, M.D.

The following method of preparing films of malarial blood will be appreciated by those who have practical experience of the ordinary methods of making cover-glass films. Besides ease and rapidity the method has other and obvious advantages.

A nurse is instructed to cleanse with spirits of wine or ether as many microscope slips as are likely to be required, and to place them, arranged in one or more rows, on a table near the patient. Three or four oblong slips of very fine clean tissue-paper, one and one-half by five-eighths inch, are also prepared. The patient's finger is cleansed, and pricked in the usual way. A droplet of blood about one-sixteenth inch in diameter is then expressed from the puncture and taken up, by touching it with one of the papers, the blood being supplied about one-half inch from the end of the paper. The charged surface of the paper is then placed upon a glass slip rather towards one end. In a second or two the blood will have run out in

a thin film between paper and slip. When this has taken place—not before—the paper is drawn along the surface of the glass. The same paper, without recharging, is placed in a similar way on a second slip, on a third, on a fourth, and so on. When exhausted, the paper is recharged from the finger as many times as may be found necessary. In this way fifty or one hundred exquisitely fine films may be prepared in five or six minutes. Labels are then attached, and the slides stored away to await convenience. Before proceeding to stain, the blood is fixed in a little absolute alcohol on the films. The slides are then dried, and stained by the borax (five per cent.), methylene blue (one-half per cent.), a few drops of the solution being applied for about half a minute. After washing and drying, cover-glasses with xylol balsam are applied. The result is excellent. If one wishes to search for crescents, a good plan is to make the films fairly thick, to fix with alcohol, and then to wash out the hæmoglobin with very weak acetic acid, two or three drops to the ounce of water. The now colorless film is again washed, stained with methylene blue, and mounted in xylol balsam in the usual way. The field not being obscured by blood-corpuscles, the large amount of blood which this method of preparation enables us to pass rapidly in review greatly favors the quick finding of any crescents that may be present. The same method of preparing blood films is equally applicable for the demonstration of other blood parasites.

On Meat-Poisoning. (*Medical Chronicle*, July, 1896.) By J. Dixon Mann, M.D., F.R.C.P.

Apart from added poison and from parasitic disease, meat may become poisonous in three ways: from the presence of disease in the animal at the time of slaughter; from micro-organisms which attack or develop in meat after slaughter; and from the presence of ptomaines. With the two first classes there may be a considerable period of incubation between the eating of the food and the commencement of symptoms; in the other class there may be a prolonged period of incubation, if the meat after slaughter has been invaded by pathogenic micro-organisms. The author groups the symptoms produced by poisonous meat in two divisions,—those due to a true infection and those due to simple poisoning. In the first division the symptoms run the usual course of an infective disease. A case is recorded by Walder (*Inaugural Dissertation*, Leipzig, 1879) in which six hundred persons were attacked after eating the flesh of a calf which was killed when moribund: the symptoms comprised headache, anorexia, photophobia, delirium, meteorism, and enlargement of the spleen and the inguinal glands. Six died, the post-mortem appearance being that of typhoid fever. In the second group the symptoms usually resemble those of gastro-enteritis, with subnormal temperature; sometimes the temperature is elevated. Some toxins produce special symptoms. An atropine-like base has been described by Anrep (*Arch. slaves de Biologie*, 1886) as having been met with in decomposing meat, most frequently in the sausages largely eaten in Ger-

many, and in certain kinds of fish, as sturgeon. The toxine contained in the same meat may cause different symptoms in different people. An instance is related of ninety-seven persons who ate the meat of a cow which when slaughtered was ill of hemorrhagic enteritis. They were seized with symptoms like cholera, within four to forty-eight hours. Nearly as large a number ate of the same meat without any ill effects. It is to be remembered that some animals are insusceptible to some toxins. Gärtner (*Thüringer ärztliches Correspondenzblatt*, 1888) examined some beef derived from diseased cow, which had caused an outbreak of meat-poisoning, and found in it characteristic bacteria. Dogs and cats ate of the meat without being affected, while rabbits, mice, guinea-pigs, a horse, and a goat were made ill by it, some dying. It has been observed in several cases that if the flesh of an animal, in a certain stage of septic disease when slaughtered, be eaten shortly afterwards, there may be no ill effects; but if kept for several days it becomes toxic, producing the usual symptoms of meat-poisoning in those who eat it. Meat may be infected with bacteria after it has been cooked, as well as in the raw state. In some cooked meat which had been kept in an ice-safe *B. proteus vulgaris* has been found, these micro-organisms having been previously present in the safe. Foster (*Centralblatt für Bacteriologie*, vol. xii.) has shown that certain bacteria not only live in melting ice, but also grow in it. The temperature of an ice-safe is usually several degrees above the freezing point; hence some of the putrefactive bacteria, if accidentally introduced into the safe, may multiply and contaminate the meat. The percentage of deaths is difficult to estimate, as the number of persons attacked is frequently not stated, the fatal cases only being recorded. The wide variation in the morality of outbreaks is very striking,—ranging from twenty-six per cent. down to zero. The table given in a recent number of the *British Medical Journal* (1894, vol. ii. p. 725) shows a mortality of about 4.3 per cent. Regarding preventive measures relating to meat-poisoning, the author especially advocates a stringent supervision of the lower class butchers, particularly in large towns, who are apt to buy diseased and even dead animals, which are converted into meat and sold at cheap prices to the poorer classes. In private houses the cellars, larders, and all places where meat, cooked or uncooked, is stored, should be kept clean, dry, and well ventilated; they should have no communication, direct or indirect, with drains. The author calls attention to the danger of buying meat already cooked, such as potted meats; these being cooked in large masses there is danger that the heat which ordinarily applied in the cooking process will kill disease-germs has not in these large pieces reached fully and equally every part of the meat,—an objection of especial force if spores be present, as they are more resistant than the micro-organisms themselves.

The Trichophyton Fungus. (*Archiv für Dermatologie und Syphilis*, vol. xxxv. Nos. 1 and 2.) By Rudolf Krösing, of Stettin.

1. Sabourand's division of the trichophyton fungus into small and large

spores, megalospores and microspores, does not appear to Krösing to be correct, as the size of the spores in the same fungus and in the same growth differs widely. In differentiating the human trichophyton according to locality the same remark applies to the head, beard, and non-hairy portions of the body.

2. In order to secure a pure culture the mycelial threads are separated by energetic agitation, preferably with water. The rubbing of the hairs, crusts, pus, etc., with silicic acid (Král's method) is not applicable in every case.

3. The attempt of Furthmann and Neebe to differentiate the varieties of this fungus by microscopic study of the cultures is not practicable; study of their macroscopic appearance seems to be the more suitable method. In order to accomplish this the conditions of nutrient media, temperature, and age, an amount of aqueous vapor in the air must be the same. Dissimilarity in any of the above makes a comparison unreliable. Potato cultures are most suitable for comparison, and we may consider the composition of healthy potatoes as constant for this purpose.

4. According to this method the fungi are divisible into three groups:

(a) Those showing a dry, pulverulent deposit, with a brownish coloration of the potato at the border of the culture.

(b) Those showing conditions similar to the above, without any coloration.

(c) Those with white downy deposit without coloration.

5. Superficial and deep affections (sycosis and trichophytia carcinota) may be caused by the same variety. Suppuration may be produced by the trichophyton alone without the presence of other organism.

6. No differences in the cultures were noticed in markedly acid or alkaline media, with or without the presence of oxygen, and no change or reaction was noticed in the media.

7. Guinea-pigs inoculated subcutaneously with fungi obtained from different places did not show the clinical features of sycosis. Subcutaneous *einverleibung* give nodular growths.

Preservation of Macroscopic Specimens.—Tores (*Centralblatt für allgemeine Pathologie und pathologische Anatomie*) describes a method, which he has tested for a year and a half, of preserving organs and tissues so that they retain the color they had when fresh. He finds that five to ten parts of a forty-per-cent. solution of formalin alone cause the organs after a time to assume a tint which differs very considerably from the natural color, but that if, instead of water for diluting the commercial formalin solution, a solution of one part common salt, two parts of magnesium sulphate, two parts sodium sulphate in one hundred parts of water be used, the color of the blood is well preserved. Further, material preserved in such a solution is better adapted for subsequent microscopic examination, since the protoplasm of the cell is less altered and the nucleus stains better and more deeply. The method he adopts is as follows: The material must be not

too long washed in water, and should be left in the formalin solution for a period depending upon their size and thickness. A kidney or spleen requires two days' immersion, and the solution should be changed once or twice, or until the formalin solution no longer gives a dirty brownish-red color. Care must be taken to bring all portions of the object into contact with the solution, and the object must be given the shape which it is to retain permanently, since the formalin solution causes it to assume a consistency such that its shape cannot afterwards be modified. In the formalin solution the organs change color and become of a dirty bluish gray. On now placing them in ninety-five per cent. alcohol the normal color returns. Before permanently placing the organ in alcohol it must be washed with alcohol until the latter no longer becomes cloudy. The material must not be washed with water; it is left in alcohol for a varying time until the normal color has again fully returned; if left longer the alcohol removes the color. For a kidney or spleen twenty-four hours will be sufficient. The permanent preserving fluid is equal parts of glycerin and water; the material floats at first, but sinks later; the color is now at its best; after a little time the fluid becomes yellowish and requires renewal. Tissues so preserved have not undergone the slightest alterations in color during nine months. The method is not applicable to the preservation of other color than that of blood; thus icteric liver is not well shown.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

POWER OF CORONER TO ORDER A POST-MORTEM EXAMINATION WITHOUT CONSENT OF THE FAMILY OF THE DECEASED.

WHERE death has followed an injury which seems to the coroner insufficient alone to produce death, he may, without the consent of the family of the deceased, lawfully order a post-mortem examination to be made; and such post-mortem examination, so made by a medical examiner in obedience to the requirements of such coroner, does not render him liable for mutilating the body without the consent of the family of the deceased, where the operation was performed with ordinary decency, without wantonly disfiguring the body.

The law was so laid down by the Court of Appeals of Maryland, in

the recent case of *Blank vs. College of Physicians and Surgeons*,¹ which arose as follows: The plaintiff, who is the widow of the deceased, brought suit against the College of Physicians and Surgeons of A. city, Doctor L. and Doctor H. In her complaint, she averred that the body of her deceased husband was wrongfully and unlawfully taken in charge by the defendants and cut and mutilated, and used as a subject for the students of the defendant college without warrant of law; and that the defendants wrongfully and unlawfully detained the dead body from burial, when demanded for that purpose by the plaintiff; and that the cutting and mutilation of the body were done secretly and clandestinely, in order to afford instruction to the students of the college, and without the consent of the plaintiff or any one acting for her.

The damage alleged to have been caused by these acts was great mental excitement and distress and bodily suffering on the part of the plaintiff. Demurrers by each of the defendants presented to the court the question whether these facts as here alleged gave the plaintiff a cause of action. The court overruled the demurrers, and the case was tried before a jury, who returned a verdict in favor of the defendants, and from the judgment entered thereon the plaintiff appealed.

From the evidence produced at the trial, it was shown that the deceased while engaged in coupling cars on a steam railroad sustained a very severe injury; his right leg was mashed below the knee, and the injured portion almost severed from the body, retaining its connection with it only by a few threads of tissue. The wounded man was a strong, stout man of good nerve and able to work.

His widow, the plaintiff, testified that he never lost any time from his work; and one of his fellow-laborers testified that he had worked with him five years, and that he lost no time. He was sent to the city hospital, where he died the next day. The College of Physicians and Surgeons supplies the medical and surgical service to the city hospital; and the patient was under the care of a resident physician who was appointed by the college. After his death a post-mortem was ordered by Doctor H., one of the defendants, and was conducted by Doctor L., another of the defendants. The post-mortem was made in a room belonging to the College of Physicians and Surgeons, where such examinations are usually made; and the two physicians just named are connected with the college, Doctor L. being a member of the faculty. The post-mortem was made without the consent of the plaintiff, the widow of the deceased, or any member of his family. Evidence was offered on the part of the plaintiff for the purpose of showing that the body was wantonly cut, mutilated, and disfigured, and the feelings of the relatives of the deceased inhumanly outraged.

On the part of the defendants, it was shown that Doctor H. was one of the coroners of the city of A., and that Doctor L. was the medical examiner

¹ 81 Md. 358.

appointed by the board of health ; also, that the post-mortem was ordered by Doctor H., as coroner, and performed, in obedience to his orders, by Doctor L.

Doctor H. testified that he ordered the autopsy because he wished to know the cause of death ; that it had been reported to him that the man's leg had been cut off by the train, and that he was brought to the hospital, and that he did not think that the loss of the leg in this way sufficiently accounted for the death, and that he could not give the death certificate without having a post-mortem. Doctor L. testified that he did not think that in the majority of cases persons in ordinary health when the leg was crushed below the knee would die from shock. Doctor Y. testified that if a healthy man should have his leg crushed off he would not think it a sufficient cause to explain the death, and in such case, if his official duty required him to give a death certificate, he would make every effort to obtain a post-mortem, and that it was so unusual for a death to occur from accident under conditions surrounding the deceased that other explanations were more probable. Doctor N. testified that when a man's leg is cut off below the knee, and he dies within thirty-six hours after the injury, the accident would not be an entirely satisfactory explanation of the death, if the man was ordinarily healthful and muscular ; and if he was required to determine definitely the cause of death in such a case, he would not consider that he had done his duty without an autopsy.

Doctor L. described his proceeding in making the autopsy, the taking out of the brain, the opening of the body, the removing and cutting into the different organs, the liver, spleen, kidneys, lungs, and heart. He testified that you have to examine all the vital organs to see the cause of death, and that the cause of death was persistent heart shock ; that the deceased had fatty kidneys, and fatty degeneration of the heart ; that the injury itself was not of such a nature as should have caused persistent heart shock, unless there was something else besides the injury which helped to produce it ; that the crushing of a man's leg below the knee was not such a thing, in his opinion, as would produce persistent heart shock. Doctor Y. and Doctor N. testify that to make a complete examination it is necessary to remove and open the brain. In short, the professional testimony in the case all tends to show that the autopsy was conducted in the usual manner.

By a public statute, the governor is authorized to appoint four coroners for the city of A. Inquests are required to be held whenever a person is found dead and the manner and cause of death shall not be already known as accidental or in the course of nature. There are other duties which coroners in the city of A. are required to perform. The municipality has the power to pass ordinances to preserve the health of the city and to prevent the introduction of contagious diseases therein. In pursuance of this power a board of health has been established, and many ordinances have been passed for the purpose of detecting and preventing the causes of diseases and removing them when they are found to exist. The board of

health is authorized and required to appoint a medical examiner, and it is made his duty to make post-mortem examinations in any part of the city when called upon by either of the coroners or the board of health. Furthermore, it is enacted that "when any person shall die in the said city, it shall be the duty of the physician who attended during his or her last illness, or the coroner, when the case comes under his notice, to furnish within forty-eight hours after the death . . . a certificate setting forth, as far as the same can be ascertained, . . . the cause, date, and place of death."

Mr. Justice Roberts, in delivering the opinion of the Court of Appeals, said, "The object of this last provision is obvious. The spread of infections and contagious diseases is very apt to occur in thickly-settled communities. It is, therefore, the part of wisdom to watch with vigilance every indication of their approach, and to investigate the causes which might, in any probability, produce them. The causes of death must be ascertained, so that means may be adopted for the prevention of other deaths from the same sources. The evidence before us exhibits the case of a public officer whose duty it is to find out and certify the cause of a death which is brought to his notice. The accident preceding his death, and disabling him, is not, in his opinion, sufficient to cause the death of a healthy person. There must, therefore, as he thinks, be some diseased condition of the injured man which contributed to bring about this result. His opinion is shared by other reputable physicians who have testified in the case. He could not honestly and conscientiously give the certificate which the law required him to give unless he made the proper inquiry into the case. In his judgment, and in the judgment of the professional witnesses, proper and sufficient inquiry could not be made without an autopsy. So far as the evidence in the case shows, or any rational inference from it, the coroner did simply his plain and positive duty in ordering the autopsy. And the medical examiner, Doctor L., was equally obliged by his duty to obey the order of the coroner."

On the prayer of the defendants, the trial court gave to the jury the three following instructions:

"*First.* There is no evidence in this case to show that the College of Physicians did any of the alleged wrongful acts mentioned in the declaration or ratified the same, and therefore their verdict must be for the defendant.

"*Second.* There is no evidence legally sufficient to show that the defendant, Doctor H., participated in any way in the commission of the alleged wrongful acts mentioned in the declaration, further than as coroner of the State of Maryland to order the post-mortem examination to be performed, and that there is no evidence legally sufficient to show that in ordering the post-mortem examination to be performed he acted wantonly, maliciously, or corruptly, and therefore the verdict must be for the said defendant, Doctor H.

"*Third.* If the jury believe that the defendant, Doctor L., performed

the post-mortem upon the body of the deceased at the order of Coroner H., as the city examining physician, and that in performing said post-mortem he treated the body with ordinary decency and did not wantonly disfigure the same, he acted within the scope of his official duty, and the verdict must be for the defendant, Doctor L."

In passing upon these instructions, the Court of Appeals said, "The College of Physicians and Surgeons permitted its room to be used for the post-mortem examination, but appears to have had no further connection with the matter. The post-mortem was a lawful proceeding. If anything irregular or improper occurred in the prosecution of it, the college took no part in it. The same thing may be said in reference to the coroner. The question regarding the charges which alleged the wanton mutilation of the body was fairly left to the jury in the last instruction. The prayers offered on the part of the plaintiff were inconsistent with those granted by the court, and were properly rejected. As the jury have acquitted the defendants of the charges made against them, it would seem to be rather an abstract question to consider what would have been their responsibility in a civil action if they had been found guilty." The court at the same time added, "It is to be hoped that few persons in a civilized country would wantonly mutilate a dead body, or would without warrant of law attempt to prevent surviving friends and relatives from performing the rites of Christian sepulture. Such acts would manifest a great depth of depravity." And the judgment of the lower court exonerating the defendants from liability was affirmed.

BOOK REVIEWS.

DE L'APHASIE SENSORIELLE (SENSORY APHASIA). By Charles Mirallié, M.D. Paris: G. Steinheil, 1896.

One of the most important contributions to the subject of aphasia is given in this work from the laboratory of Dr. Dejerine. The author begins with the methods to be employed in the study of a case of aphasia, after this he gives the history of the affection and a short chapter on the etiology. A lesion of the Sylvian artery is a common cause, and is frequently the result of mitral stenosis. An area of softening is usually found at the autopsy.

As far back as 1874 Wernicke described a symptom complex characterized by word-deafness and word-blindness with paraphasia and agraphia, and attributed this to a lesion of the posterior third of the first temporal convolution. In all the cases in which an autopsy has been obtained destruction of the first temporal or of the angular gyrus of the left side has caused word-deafness and word-blindness, with predominance of one or the other, associated with disturbance of speech and writing. Agraphia and paraphasia are constantly found in these lesions. There is but one form of sensory aphasia, as Wernicke has shown.

Sensory aphasia may begin acutely or gradually, and usually there is no paralysis of the limbs, occasionally there may be slight temporary right hemiparesis. In rare cases it develops in successive attacks until it finally becomes permanent. The degree of word-deafness varies: usually the patient recognizes his name, and sometimes a few well-known words; he may catch a familiar word and guess a question correctly. If, however, the same word is used in another question the deception is detected. When several languages have been spoken the one most familiar is the one most apt to persist, and if all are lost this is the first to return. The centres for music are distinct from those for speech, but are located near the latter, and yet involvement of one set may occur without the other.

In word-blindness the value of symbols is perfectly preserved. One of Dejerine's patients was incapable of reading the words *République Française*, but he recognized at once the meaning of the letters R. F. presented in the manner so commonly seen in France. A person may have word-blindness without letter-blindness, and he is usually able to recognize his name when written, and sometimes a few familiar words, as in word-deafness. He may read some one word correctly and guess at the meaning of the sentence, but the deception may be detected in the same manner as in word-deafness. The ability to read letters persists after the loss of the understanding of words, because letters are first learned and have made a deeper impression. Memory of figures is usually in part preserved. Optic aphasia (inability to name an object by sight alone without the employment of the other senses) may be found in sensory aphasia; psychical blindness (in which the patient does not recognize a person or object) may also be present. Optic aphasia and psychical blindness have been observed only in sensory aphasia.

True paraphasia is very rare. In this form every word uttered is well known and complete, but the combination of these words conveys no meaning, or, at least, only an imperfect one. A sensory aphasiac may recognize his name when written or spoken and yet be unable to pronounce it himself; this is because every one hears and sees his name constantly from early childhood, and the impression produced is lasting, whereas one seldom has occasion to pronounce his own name, and the motor image of articulation of the name is not so durable.

As the sensory aphasiac usually has preservation of all movements, spontaneous writing or that from dictation is easily tested, and is always found impaired during the greatest development of the disease. Often he can only write his name spontaneously, and he may write this better than he can copy it when written, or he may in rare cases show paraphasia or jargon aphasia in writing. Figures are usually better written. He copies servilely, mechanically, as one would copy hieroglyphics, and requires a long time. Right lateral homonymous hemianopsia is frequent in sensory aphasia, but depends entirely on the depth of the lesion, and is only present when the optic radiations are cut. The intellect is usually more affected in sensory than in motor aphasia, and the pantomime is always lessened.

When the supramarginal, angular, and posterior parts of the first temporal gyrus are destroyed the sensory aphasia is complete, and the patient usually remains for the balance of his life with word-blindness, word-deafness, paraphasia, and agraphia. If the lesion predominates in the angular gyrus the word-deafness becomes less, but never disappears completely, and the patient is usually hemianoptic. If the lesion predominates in the first and second temporal gyri word-deafness persists, the patient has paraphasia, word-blindness which may be difficult to demonstrate, and total agraphia.

Word-blindness and word-deafness are simply subvarieties of Wernicke's one form of sensory aphasia, and it is exceptional for either to exist alone from the beginning of the disease. Persons once afflicted with sensory aphasia seldom if ever fully recover the intellectual faculties; speech may be restored, but some impairment always remains. The prognosis of sensory aphasia is more grave than of

motor aphasia: the latter may fully disappear. Either form of aphasia, if it occurs in childhood, usually completely disappears.

"Pure" sensory aphasia (in which only one of the elements of speech has been lost and the word-concept is perfect) does occur. In these forms the speech zone is intact, it is only deprived of one of its connections with the motor, visual or auditory cortex. In pure word-blindness the loss of understanding of printed or written words is the same as in ordinary sensory aphasia, but the visual images are intact. The patient can, therefore, write perfectly, but cannot read his writing; he copies mechanically, and as much like the model as possible; he understands all said to him, and speaks as a normal individual. Usually the blindness is both verbal and literal. In this form of aphasia the patient may recognize written words by tracing the lines with his finger, as in this way he influences the visual images which are not destroyed but merely incapable of being aroused by the ordinary method of sight. Hemianopsia has existed in all the cases published. The ability to read figures may be preserved or lost. Intelligence is perfectly intact. Dejerine has published the first autopsy of this form. The cause is to be found in destruction of the tracts which unite the right and left general visual centres with the left angular gyrus.

In "pure" word-deafness (Serieux) the understanding of the spoken word is lost, but all the other forms of speech are perfectly intact. In subcortical ("pure") motor aphasia, the power of articulation of words is lost, but the patient knows perfectly the words he wishes to say; he is able to indicate the number of syllables in a given word; he understands spoken and written words, and writes like a normal individual.

Sensory is easily distinguished from motor aphasia. The sensory aphasiac is verbose (jargon aphasia); the motor aphasiac only has a few words at his disposal; word-blindness is less marked in motor aphasia, word-deafness is absent or only detected by most careful examination; agraphia is complete except for a few familiar words; the ability to copy is preserved, and the printed word is transcribed as script which represents an intellectual act; the sensory aphasiac, on the other hand, makes an exact copy in every detail.

Dejerine believes the so-called transcortical motor aphasia, characterized by better articulation of repeated words and of song than of spontaneous speech, is merely a stage of amelioration in the cortical motor aphasia. There is not a single well-observed case of the so-called transcortical sensory aphasia.

The curious condition of dyslexia, which is intermittent alexia, in which the patient must stop and rest after reading a few words, is probably due to functional ischæmia of the angular gyrus.

Mirallié considers that one writes by reproducing on paper the images stored up in the angular gyrus. Agraphia results whether the lesion is in the visual, motor, or auditory centre. Every alteration of the speech-zone causes agraphia, and there is no necessity for assuming a special centre for writing.

If psychology admits four elements in a word, it does not follow that each corresponds to a distinct centre in the brain. The educated individual, when he speaks or writes, employs the same centres as a child in learning. That an hysterical patient may be made word-blind without being made agraphic, or *vice versa*, is not a proof of a graphic centre; it is simply the result of suggestion. A case of "pure" agraphia has never been clearly demonstrated. Arguments against the theory of a centre for writing are: The existence of agraphia due to a lesion of the angular gyrus is well known. Every destruction of the motor images of articulation causes agraphia and alexia. Bar's case is the only one in which a lesion was limited to the foot of the second frontal convolution, and it caused motor aphasia as well as agraphia. Agraphia results from an alteration in any part of the speech-zone. There is not a single example of "pure" agraphia independent of motor or sensory aphasia. If the centre

for writing exists, *agraphia* alone should have been present in Bar's case. In such a case as that reported by Mlle. Skwortzoff, in which the patient was only able to write spontaneously the words he was able to pronounce spontaneously and to understand in reading, it is necessary to suppose that a lesion had destroyed exactly similar visual, graphic, and motor images if the theory of independent centres is to be accepted. This observation is rather in favor of the intimate connection of the centres, and the involvement of all in a lesion of one. One can write with many parts of the body. If there is a centre for writing it must comprise all the psychomotor zone, and one must admit a centre for all the specialized movements of the body. The advocates of a special centre for writing do not regard it as a simple motor centre. Charcot considered *agraphia* as *aphasia* of the hand,—as *amnesia* of the graphic images. The entire question hinges on the existence of graphic images, and if there is a centre for these images, destruction of it ought to involve all forms of writing (Dejerine). In motor *aphasia* spontaneous writing is absent, but copying is preserved, and yet the same movements are made in both. Left-handed people usually write with the right hand; when such a person becomes motor *aphasic* he is hemiplegic on the left side, and the right hand has lost the power of writing, although it has preserved all other movements. There are no autopsies of this form reported. One might suppose the existence of two lesions, one in the right hemisphere which had caused the hemiplegia and motor *aphasia*, and one in the left hemisphere which had destroyed the centre for the graphic images. Such a supposition is untenable.

Mirallié, in order to ascertain if the loss of the ability to write is dependent on the destruction of the graphic images, or whether one writes by transcribing on paper the visual images stored up in the angular gyrus, and if *agraphia* is not merely an alteration of the word-concept, experimented with separate letters, as has been done by others. His cortical motor *aphasiacs* were unable to spell words with the blocks. The *agraphia*, therefore, in cortical motor *aphasia*, does not consist in the inability to trace letters on paper: it is not a loss of graphic images, but results from the impossibility of evoking the concept of words and letters. For this reason the cortical motor *aphasiacs* cannot spell better with separate letters than they can write with a pen.

Charcot's conception of the speech-zone was as follows: there are four centres,—one for the motor, one for the graphic, one for the visual, and one for the auditory images. Although they are united, education may give a predominance to one of these centres, and one may be employed especially in the process of thought. Those who employ all in equal degree are said to be indifferent. This view Mirallié cannot accept.

Freud's idea that the associative tracts play the most important part in *aphasia* is not grounded on facts. The existence of centres for word-hearing, word-seeing, and articulation is admitted by all authors. These are located in the left hemisphere alone, except in left-handed persons; the motor centre of articulation occupies the foot of the third frontal convolution; the auditory and visual centres are located at the posterior part of the first temporal and in the supramarginal and angular gyri. Freud gave the name of "zone of speech" to these convolutions. Any lesion of any one of these three centres involves the function of the other two.

Mirallié reports sixty-two carefully observed cases of sensory *aphasia*,—fifty-eight with autopsy. Most of these are known in the literature; a few have never been published, and others have been studied by the author himself. One very important observation made by Mirallié, and given at length, is a case of sensory *aphasia* with temporary right hemiparesis, considerable amelioration of word-deafness, complete *alexia*, *paraphasia* with jargon *aphasia* very pronounced for spontaneous and repeated words, total *agraphia* (the patient could not even write his name), no psychical blindness, no optic *aphasia*. Hemianopsia could not be tested.

Autopsy.—Macroscopic appearance: Lesions of the supramarginal and of the adjacent part of the angular gyrus, and of the lower part of the parietal lobe of the left side. Microscopic appearance: Large area of softening in the posterior marginal fissure of the island of Reil, destruction of the lower part of the parietal lobe, destruction of fibres passing to the angular gyrus, small primary area of softening in the cortex of the angular gyrus, another area in the white matter of the ascending frontal convolution, descending and retrograde degeneration in the optic radiations, inferior longitudinal fasciculus, pulvinar and external geniculate body, degeneration in the internal capsule and crus.

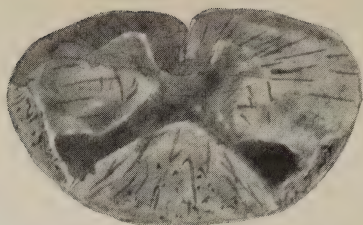
W. G. S.

ITEMS OF INTEREST.

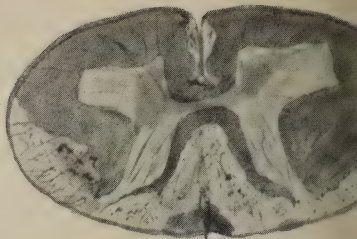
It is a favorite axiom of the optimists that everything has its uses. But it has remained for the New Mexico Territorial Board of Health to find a new use for the patent medicine almanac. In a recently issued circular on the prevention of consumption, among other things, it advises that "every person so affected should spit into some receptacle and should see that the sputum is soon destroyed by fire. About the house there is no better way than to spit between the leaves of patent medicine almanacs,—to be had freely at all drug-stores,—and after a half-dozen or more spittings, burn the book." —*Journal American Medical Association.*

On the occasion of the twentieth anniversary, on July 16, of the opening of the Imperial Office of Health, the Faculty of the University of Jena conferred upon Prince Bismarck the honorary degree of M.D. The diploma is on parchment, and the seal of the Faculty is contained in a capsule of oxidized silver, on the front of which are the Prince's arms in relief, crowned by Æsculapius and Minerva, with the date July 16, 1896, beneath. The reverse is adorned with a representation of the market-place of Jena, with the Bismarck Fountain and the inscription "Jena, July 30, 31, 1892." The diploma and the capsule are contained in a cylinder of embossed leather, partly gilt and partly painted in bright colors. The top is decorated with the Prince's arms, and the bottom with the insignia of the degree of Doctor of Medicine, both wreathed with laurel and ivy. Prince Bismarck is now possessed of all the doctor's degrees that the German Universities can bestow.—*British Medical Journal*, July 25, 1896.

C. 1.



C. 7.



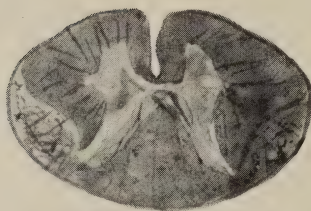
C. 2.



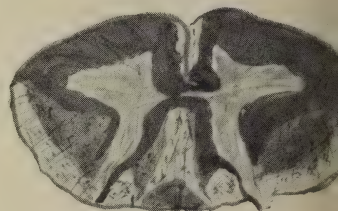
C. 8.



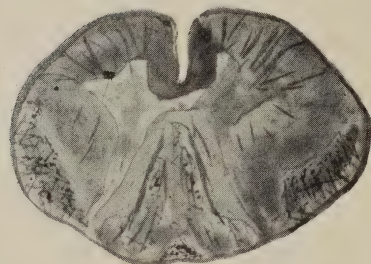
C. 3.



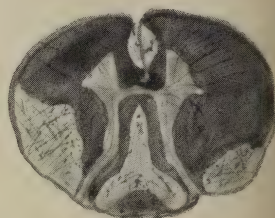
D. 1.



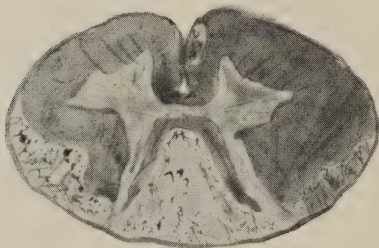
C. 4.



D. 2.



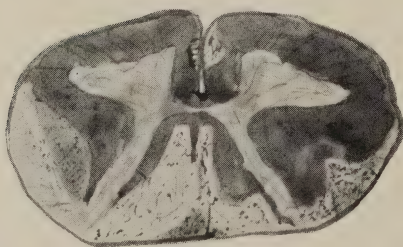
C. 5.



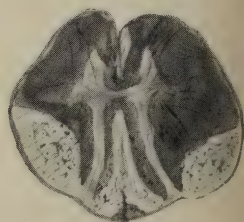
D. 3.



C. 6.



D. 4.



INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

SEPTEMBER, 1896.

[No. 8.

ORIGINAL COMMUNICATIONS.

*THE SPINAL CORD IN A CASE OF PERNICIOUS ANÆMIA.*¹

BY C. EUGENE RIGGS, A.M., M.D.,

St. Paul, Minn.

MRS. B., aged forty-five, was referred to me in September, 1895, by Dr. Goetfried Starm. She was paraplegic and exceedingly anæmic; the paraplegia was, however, not complete; she could move her limbs, although unable to walk or stand. Her disease seemed to date from some nervous shock three years previous, when one of her children had been injured at school and died from the effects; she had never been the same person since. Two years before I saw her she had been seriously sick with an ill-defined trouble, which, I am informed by Dr. E. J. Abbott, her physician at the time, presented many of the clinical symptoms, but none of the physical signs, of an acute tuberculosis. In July, 1895, the loss of power in the legs was first observed. Her temperature during her illness fluctuated between normal and 100° F.

After her death I was told that at one time she was supposed to have suffered from Bright's disease. Examination of the urine, however, while she was under my care at the hospital was entirely negative. She complained especially at night of a sensation as if, as she expressed it, her bones were going through her flesh.

Examination showed that tactile sense was markedly diminished over both lower extremities and over the trunk as high as the ensiform cartilage,

¹ Read at the annual meeting of the American Neurological Association, June 2, 1896.

being most marked over the area supplied by the anterior crural nerve. Temperature sense was normal, while that of pain was diminished. She complained of distressing paræsthesia, especially in the area of lessened tactile sensibility; it was present in the upper extremities as well. Rectus clonus was marked in both legs; patellar reflexes were exaggerated. At my first examination I succeeded in obtaining ankle clonus; later it became barely appreciable. There was no ataxia either of the extremities or of the trunk; no lightning pains.

Superficial reflexes: Plantar diminished; gluteal diminished, abdominal epigastric, dorso-lumbar absent; interscapular present.

On October 21 a blood-count was made by Dr. Charles L. Greene which showed 2,264,000 cells per cubic millimetre, representing a count of eighty squares. Hæmoglobin thirty per cent., adherent poikilocytes, microcytes, and megalocytes. On November 27 another blood-count was made, showing 1,340,000 cells per cubic millimetre. The post-mortem examination, by Dr. A. W. Dunning, was made about six hours after death. Subject was found extremely white and but little emaciated; calvarium normal in thickness and easily removed; meninges not unusually adherent. On removal of the cerebellum there was found a necrotic area the size of the end of the little finger, located upon the posterior surface of the petrous portion of the right temporal bone, just below the attachment of the tentorium cerebelli. The forceps were thrust into this aperture to the depth of three-quarters of an inch in a forward and outward direction into the mastoid process. The spinal cord was removed by dividing the pedicles, thus exposing the spinal canal anteriorly. Within this canal in the mid-dorsal region was found a considerable extravasation of blood, together with a quantity of apparently serous effusion. The thorax was filled with serum; the pericardium was distended, and the abdomen also contained a large quantity of serum. The blood-vessels were everywhere empty and colorless. The heart was pale and flabby, with a small clot of blood in each ventricle; liver was enlarged; the spleen was dark and also enlarged. The pancreas was enlarged and extremely fibrous; the intestines were thin-walled and pale; the lungs normal in size and apparently healthy.

MICROSCOPICAL EXAMINATION.

The upper three segments of the spinal cord were attached to the brain when received in the laboratory, and, together with the brain, were hardened in four per cent. formalin.

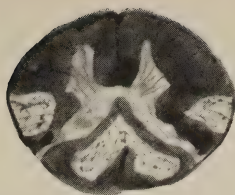
In hardening, these three segments were somewhat flattened dorso-ventrally by the weight of the brain partially resting on them. The remainder of the cord was hardened in Müller's fluid and alcohol. This portion was slightly twisted at the level of the D. 6.

(All the segments were then separated, embedded in celloidin, soaked *en bloc* in copper acetate solution, cut, stained in Weigert's hæmatoxylin, decol-

D. 5.



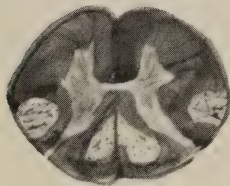
D. 12.



D. 6.



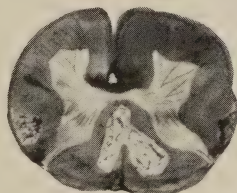
L. 1.



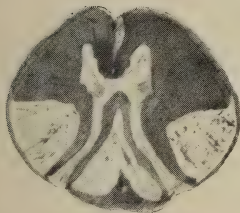
D. 7.



L. 2.



D. 8.



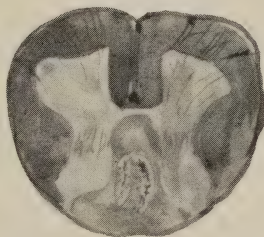
L. 3.



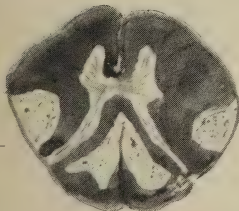
D. 9.



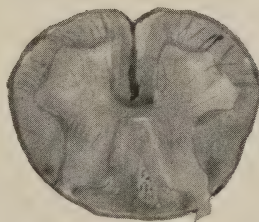
L. 4.



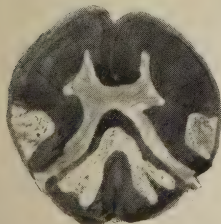
D. 10.



L. 5.



D. 11.



orized in potassium ferricyanide and sodium biborate solution, cleared in clove oil, and mounted in xylol-balsam.)

On examination with low power the following degenerations were observed :

1. *Anterior Pyramidal Tract*.—The area of degeneration was greatest at the level of the C. 6, much less at the level of the C. 5, and showed only as a trace on the right side in the C. 4. Below the D. 7 it became gradually reduced in size till it finally disappeared as a trace on the right side at the level of the D. 8.

2. *Direct Cerebellar Tract*.—The area of degeneration appeared as a trace at the level of the D. 10, gradually increased in extent to the level of the D. 4, and continued thence without materially changing in size to the C. 1. The area was greatest on the left side throughout the whole extent of the cord.

3. *Cross Pyramidal Tract*.—The area of degeneration appeared as a trace in the C. 2, gradually increased in extent to the level of the D. 8, and decreased from there to the L. 3, where it disappeared. It was greatest in the left side throughout.

4. *Column of Lissauer*.—The area of degeneration extended from the C. 1 to the D. 6, and was greatest at the C. 6.

5. *Column of Burdach*.—The area of degeneration extended from the C. 1 to the L. 3, being greatest at the level of the D. 6. The degeneration was most marked at the median and posterior margins of the column.

5(a). *Posterior External Field of Posterior Column*.—The area of degeneration extended from the C. 1 to the D. 7, being greatest at the C. 5.

6. *Column of Goll*.—The area of degeneration extended from the C. 1 to the end of the column, being greatest at the D. 6 and the C. 3. From the C. 4 downward the posterior median aspect of the column was less degenerated than the other portions, and from the L. 2 downward the area in the right side was wider than on the left.

All other columns were normal throughout their entire extent.

Examination of the degenerated areas with high power showed axis cylinders and medullary sheaths in various stages of disintegration. Many of them were granular and others fatty. The degenerated columns, especially in the mid-dorsal region, were shrunken and contained an excess of connective tissue.

The gray matter appeared normal throughout.

The arteries wherever present showed a thickening of the endothelium, and here and there an inward projecting growth of new connective tissue.

The Liver.—(The liver was hardened in alcohol, embedded in celloidin, cut, stained in lithium carmine, treated with potassium ferrocyanide and acid alcohol, cleared in clove oil, and mounted in balsam.)

Examination showed areas of fatty infiltration and degeneration, and an enormous deposit of hæmosiderin and hæmatoidin, both in the liver cells and in their trabeculæ. The pigment was mostly in the centre zone, but

extended in some lobules through the middle zone, even lining the walls of the capillaries.

Spleen.—The spleen was treated as the liver. The only pathological change observed was a scattered deposit of the same pigments found in the liver.

Arteries.—(Portions of arteries from the circle of Willis were hardened in alcohol, embedded in celloidin, cut, stained in lithium carmine, cleared in xylol, and mounted in balsam.)

Examination showed thickening of the middle coat.

No apparent relation existed between the areas of degeneration and the mid-dorsal clot noted at the post-mortem. The points of origin of degeneration were widely separated, some lying in the upper cervical and others in the lower lumbar. None of the columns, except possibly the left direct cerebellar and the right direct pyramidal, had all their fibres involved, supposing their sectional areas to be correctly figured in the standard atlases.

Taken as a whole, it would seem that the scleroses were certainly not systemic in their origin, but probably were of vascular origin.

This view is held by Nonne, and quoted by Marie, in the *Revue Neurologique* for November, 1895.

Nonne examined cords in seventeen cases of pernicious anæmia, in seven of which the findings were negative; in three the lesions were clearly defined in the neighborhood of vessels, and in the last seven there were medullary lesions of pronounced type. The first two of these groups showed no distinctive clinical symptoms; not even in all the cases of the third group were they present, and when found consisted mainly of the loss of the knee-jerk, a slight ataxia, and some troubles of sensation.

Nonne concludes further that the pathological characteristics are small patches of degeneration, beginning in the cervical cord, showing predilection for the root-zones of the posterior columns, as well as for the anterior and lateral columns.

The findings in this case would seem to bear out Nonne's conclusions.

Osler also quotes Lichtheim, Morris Lewis, and Burr as reporting cases of sclerosis of the posterior column. He further notes the constant and peculiar distribution of hæmosiderin in the liver.

*FEBRILE ENDOCARDITIS IN THE AGED.*¹

BY W. M. GIBSON, M.D.,

Utica, N. Y.

IN my consultation practice I have often been surprised at the accuracy with which practitioners who rely chiefly on their text-books for their information make the diagnosis of valvular heart-lesions and detect changes in the heart-muscle. But it has been the exception to see, in consultation, cases of febrile endocarditis in the aged in which the febrile condition was attributed to the endocardial inflammation. One reason for this, it seems to me, is that the average text-book on the practice of medicine, in dealing with natural lesions of the heart, does not call sufficient attention to the fact that in old people a reinflammation of a cardiac lesion is not an uncommon thing. It must be remembered, also, that we do not look for febrile conditions in advanced life, apart from pneumonia, so much as for degenerations or disorders of nutrition, or diseases characterized by cachexia.

Febrile endocarditis in the aged is almost always ingrafted on an old valvular lesion. The disease, however, may have its origin late in life in an attack of acute articular rheumatism, or it may result from some other form of infection.

In all of the cases coming under my observation, a history of a previous valvular heart affection could be obtained. In our text-books the following are mentioned as exciting causes of acute endocarditis: rheumatism and many of the other infectious diseases, especially scarlet fever, diphtheria, pneumonia, erysipelas, pyæmia, small-pox, and typhoid fever. It is also recognized that it may occur as a complication in phthisis, Bright's disease, diabetes, cancer, and gout. It may occur also in the course of otitis media, pyephlebitis, phlegmonous inflammations, periosteal disease, and necrosis of bone. I have met with it as a complication of dysentery in aged people. Recently I have found that a common cause of reinflammation of an old cardiac lesion in an aged person is the form of influenza which has prevailed so widely during the last few years. The nervous exhaustion and the depression of general vitality resulting from an attack of influenza must impair the nutrition of the endocardium as well as that of the heart wall.

Among old men I have found that endocarditis is not infrequently the result of infection from a purulent inflammation of some portion of the genito-urinary tract. Injuries of the prostate and deep urethra by dirty or forcibly-used catheters are dangers which cannot be regarded lightly in aged

¹ Read at the annual meeting of the American Climatological Association, May 12, 1896.

subjects of valvular heart-disease. Bad hygienic surroundings, long-continued exposure to cold and damp, and the excessive use of alcohol have, too, some influence in depressing heart nutrition.

Traumatic infection in the aged is always a serious matter, and doubly so if the aged person is afflicted with a heart lesion. It must be remembered that traumatic lesions in the aged are not always accompanied by external signs of infection, and that the evidences of infection are often only to be found in parts distant from the seat of the injury.

Prolonged grief and shock seem to have some bearing as causative agents in this form of endocarditis. One case occurring in my practice, that of a man, aged sixty-three years, who succeeded in keeping up a compensation for an aortic obstruction and mitral regurgitation for nearly twenty years, developed, immediately after the sudden death of his wife, an endocarditis which wound up in a fatal uræmia. No other cause could be assigned for this endocarditis except the depression of nutrition attendant on his grief.

In another case of a similar lesion in a woman, aged seventy-five years, shock caused by being roused up from sleep by a burglar, was followed by rapid dilatation of the heart and endocardial inflammation, which was accompanied by febrile movements lasting nearly two months.

A definite relationship seems to have been established between endocarditis and certain micro-organisms. Weichselbaum, in a series of twenty-nine cases, found in seven the *diplococcus pneumoniae*; in six, the *streptococcus pyogenes*; in two, the *staphylococcus pyogenes*; in eight, bacteria of various natures; and in the remaining six the culture-experiments were negative. He found also that pure cultures of *streptococcus pyogenes* and *staphylococcus aureus*, when injected into the veins, gave rise to endocarditis; but Weichselbaum calls especial attention to the fact that this endocarditis was far more malignant if the valves of the heart were not in a normal condition at the time of the experiments. Remembering the pathology of endocarditis, we can easily see that thrombotic deposits upon the altered valves or necroses of the endocardium may readily occur in almost any form of blood infection. We must remember, too, in studying endocarditis in the aged, that the essential change in the senile heart is a weakened heart-wall, and also that the senile heart has to deal with alterations in the structure of the arteries. Again, that the resulting venous stasis not only calls on the weakened heart for greater work, but also interferes with the nutrition of the nerve-centres, which furnish the energy that governs the vascular mechanism.

With a knowledge of the condition of the senile heart, it is rather to be wondered at that endocardial inflammation is not more commonly met with in old age; but perhaps the anatomy of the organ may explain this; the fact that the heart in performing its work provides for its own nutrition first, and that of the brain next.

If an attack of endocarditis in an aged person results from a rheumatic

infection, the symptoms are usually pronounced enough to call attention to the heart early in the onset of the disease. Again, if it occurs as a result of serious traumatism, it can hardly be mistaken.

A few such cases have come under my observation, and their clinical characters have stamped them as high-grade acute maladies. These cases have been speedily fatal, dying either from uræmia, embolic pneumonia, cerebral embolism, or general septicæmia, and were undoubtedly cases of acute typhoidal or malignant endocarditis, and were easily recognizable as such from the onset.

In the majority of the cases that I have seen, the course of the disease was subacute or lingering. A history of gradual loss of strength, interference of digestive functions and general nutrition, without apparent cause, was obtained. The subacute form of endocarditis in the young and in adult life runs, as a rule, a protracted and irregular course, and in the aged this disease does not differ much in this respect; if anything, its course is more irregular, and it may be weeks before alarming symptoms are manifested. Rarely at the onset is there much dyspnoea or pronounced interference with cardiac functions.

The misleading features of endocarditis in advanced life are those which are common attendants on degenerations and cachexias. The progressive emaciation and disturbance of stomach and intestinal digestion are very apt to call attention to the state of the digestive organs and institute a search for a new growth, or some profound disturbance of digestion. Again, the chills and sweats, with an irregular type of fever, lead one to suspect the onset of some one of the fevers. Some of my cases passed on into a low typhoid condition, with many of the characteristics of that state, including enlargement of the liver and spleen, before marked interference with the circulation became apparent, or before an embolism of the brain, lung, or kidney occurred to demonstrate the serious nature of the endocardial inflammation.

In the early stages of the disease the temperature-curve is generally irregular, but, as a rule, as the disease advances the fever becomes continued. High temperatures are not usually recorded, except in malignant cases, or at times in the course of the disease when an embolism occurs, or when pneumonia becomes a complication.

The continued type of the fever is also broken if the case becomes thoroughly septic; then the temperature may range from an extremely high point to subnormal. The fever of endocarditis in the aged seems to bear a certain relationship to the character of the infection producing the endocarditis. But if an infection has not been detected and the physical signs of an endocarditis have not been appreciated, although perhaps recognized, this febrile movement is a very misleading and perplexing symptom.

I have been called in consultation in a number of these cases simply because the attending physician could not make out the nature of the fever he was dealing with. Some of these cases were regarded as irregular cases

of typhoid fever by the physicians in charge. In all of them there was a history of a previous valvular lesion, and there were present the physical signs of an acute endocarditis.

In drawing a line between endocarditis and typhoid fever in aged people, it seems to me that the statistics compiled by eminent clinicians should be borne in mind. For instance, Liebermeister gives the percentage of cases of typhoid fever occurring in aged people between the years of sixty-one and seventy as only 0.06 per cent. The mental hebetude characteristic of typhoid fever is seldom, if ever, present in the early stages of endocarditis in the aged. In typhoid fever in the aged we would expect to meet with very alarming cerebral symptoms if the infection were deep enough to produce endocarditis early in the course of the disease.

In endocarditis in the aged, the mind, as a rule, is clear and the patient is often able to direct his affairs with but little fatigue. Even after a continuation of the febrile condition for several weeks it is remarkable how little disturbance of cerebral function is exhibited, unless a cerebral embolism has occurred. The nervous symptoms we do meet with are chiefly those of mild febrile and toxic irritation, such as slight headache, disturbed vision and hearing, restlessness and insomnia. In all of these cases it seems to me much better to regard the febrile condition as the result of an endocarditis rather than to look on it as the expression of a typhoid infection.

I have the records of twelve cases of subacute endocarditis in aged people which were mistaken for various types of malarial fevers. In no one of these could any of the forms of the *Plasmodium malarie* be detected. The chills, the fever and sweats, the enlargement of the liver and spleen, and the digestive symptoms were all pointed out as evidences of malarial infection. The heart-murmurs, the progressing changes in the heart wall, the dyspnœa, and in some instances cerebral and renal embolism, while recognized, were considered results of malarial infection.

In one case my diagnosis of endocarditis, instead of malarial fever, was considered refuted by the occurrence of a profuse hæmaturia, although the hæmaturia was followed by a suppurative nephritis. But one case has come under my observation in which the malarial plasmodium was detected during an attack of endocarditis in an aged person, a case that occurred in the practice of Dr. Ford, of Utica, and I think he will agree with me that the malarial symptoms played a very unimportant part compared with those of endocardial inflammation.

The diagnosis between malarial fever and endocarditis in the aged, it seems to me, can readily be made, especially if the patient has not received much quinine. I have found that even ordinary doses of quinine affect the aged subject of an endocarditis unfavorably, and its administration could hardly be carried to the point of clearing the blood of malarial parasites without producing much heart-depression. In the stage of septicæmia in endocarditis the general disturbances are so profound that, were they due to

a malarial infection, the plasmodium would be present in great enough numbers to admit of ready detection by a careful observer. If in one of these cases this organism cannot be detected, and all the physical signs of a progressing inflammation of the endocardium are present, this, with a history of a previous valvular heart lesion, ought to be sufficient to indicate the true nature of the disease.

As I have remarked before, the progressive emaciation and digestive disturbances seen in the endocarditis of the aged might lead one to suspect the presence of a new growth.

Persistent vomiting which is often present is certainly misleading. I saw a case this winter, a man, aged sixty-seven years, who had been reduced to an extreme degree of emaciation, after a siege of two months of fever, attended by vomiting which could be controlled only for a day or two at a time. Just previous to my visit he was seized suddenly with a severe pain in the pit of his stomach and vomited shortly after a considerable quantity of fresh blood. At about the centre of the lesser curvature of the stomach a small circumscribed tumefaction could be detected. Physical examination of the heart revealed harsh blowing murmurs at the aortic and mitral orifices, and also extreme dilatation. This man gave a history of having irregular chills, fever, and profuse sweats for several weeks prior to the fever becoming continued. The urine was highly albuminous and contained numbers of granular casts. The physician in charge of the case had been very much puzzled to account for the febrile symptoms, but, while recognizing the heart lesion, had suspected the presence of cancer of the stomach. The occurrence of the hemorrhage and the detection of the tumor seemed to him a confirmation of his suspicions. I ventured to make the diagnosis of endocarditis with embolism of a branch of the gastric artery. I saw this case recently when all the febrile symptoms had subsided, the tumefaction in the wall of the stomach had disappeared, the vomiting had ceased, and the cardiac lesions were again being compensated for.

Another case coming under my observation, that of a man, aged sixty years, gave a history of several attacks, preceded by periods of irregular chills and fever, sweats, and persistent vomiting. From the last attack he passed into a low septic condition. He had become greatly weakened and much emaciated. The diagnosis of cancer of the stomach had been made by several physicians. I found at my visit all the evidences of endocarditis with dilatation of the heart-walls. The urine was loaded with albumin, granular casts, pus-casts, and Ultzman's pus-plugs. In view of the man's septic condition and the physical signs of an endocarditis, the diagnosis of cancer did not seem to me warranted, especially as no tumor could be made out. He passed into a low typhoid state, and died from exhaustion. At the autopsy no trace of a new growth could be detected. In the mucous membrane at the cardiac portion of the stomach several small, light-yellow patches were found, from which radiated distended veins, evidently the results of minute embolisms. The liver and spleen were much enlarged

and showed evidences of parenchymatous degeneration. The right kidney presented the condition of complete fatty involution, and in the left kidney numerous pyæmic abscesses were found. The heart was extremely dilated, the walls thin and softened, and the valves were ulcerated and covered with thrombi of recent formation. The history of this case extended with some intermissions something over two years; during the greater part of this time a continued temperature-curve was noted by the thermometer.

In following up, then, our cases of valvular heart lesions in aged people it may be well to bear in mind that an inflammation of old lesions can easily be provoked, and that while we seek to keep up compensation for the obstructing lesion or the insufficient valves we must be on the watch for something more than the signs of failing heart muscle. Pyrexias, even of short duration, should be regarded with suspicion. Recurrent attacks, especially if accompanied by chills, digestive disturbances, or any septic symptoms, warrant the assumption that the old lesion is the seat of a new endocardial inflammation, even though pronounced cardiac symptoms are absent.

A CASE OF ANEURISM OF THE ABDOMINAL AORTA WITH THROMBOSIS OF THE RIGHT RENAL ARTERY.

BY JOHN H. MUSSER, M.D.,

AND

J. DUTTON STEELE, M.D.,

Philadelphia.

THE patient was a negro, aged forty-seven years, a native of New Jersey, and a laborer by occupation. He was admitted to the medical wards of the Philadelphia Hospital, May 1, 1896. His mental condition was such that the following data were obtained with difficulty:

His mother, father, and five brothers are dead of unknown causes. Four brothers and one sister are alive and healthy. There is a history of alcoholism in the family, but no tuberculosis or rheumatism. He had had typhoid fever and pneumonia in boyhood, but never scarlet fever. No history of syphilis or alcoholism could be obtained. For two weeks previous to admission he had had much pain in the left iliac region, running across to the right hypochondriac. He was constipated, and had had several obstinate attacks of hiccough. There is no history of ascites or œdema at any time. The patient is delirious at intervals, and his statements are indefinite and unreliable.

Examination, upon admission, by Dr. Musser: There is considerable emaciation and muscular wasting. The pupils are contracted and are equal. The patient is in a condition of muttering delirium and can be aroused with difficulty. The abdomen is contracted to a marked degree, and the muscles of the abdominal wall are so rigid and there is such exquisite tenderness over this entire region that no data can be obtained by the usual methods.

Superficial cardiac dulness extends three and a half inches to the left of the

midsternal line, and by auscultatory percussion three-fourths inch farther to the left. The right border corresponds with the midsternum. The upper limit is the upper border of the third rib. The apex-beat is in the fifth interspace in the midclavicular line. The heart-sounds at the apex are muffled and indistinct. The second sound in the aortic area is accentuated and bell-like in character. The pulse is of high tension, and the radial and temporal arteries are thickened and rigid.

There is an area between the right nipple and the right edge of the sternum where the resonance on percussion is high-pitched, the tactile fremitus is lessened, and the breath-sounds are suppressed. The heart-sounds are transmitted to and clearly heard in this region. Vocal resonance is increased over the apex of the right lung anteriorly, but the breath-sounds are suppressed over both apices. Posteriorly there is suppression of the respiratory murmur over the upper third of both lungs. It is fairly distinct at the bases. There are no râles.

The upper border of the liver dulness corresponds with the upper border of the seventh rib.

Urine.—The amount secreted in the twenty-four hours following admission was twenty-four ounces. Its specific gravity was 1020. It was acid in reaction, and contained one-fourth, by bulk, of albumin, many pale granular casts, and much uric acid.

The temperature upon admission was 99° F., but it soon became subnormal, and ranged between 96° and 97° F. until death.

The amount of urine increased slowly to fifty-two ounces in the twenty-four hours upon May 12, and then gradually diminished in amount until death. Its chemical analysis remained practically the same.

The patient had several severe and obstinate attacks of hiccough while under observation. He was constipated and vomited frequently. The mental symptoms grew progressively worse, and five days before death he passed into a condition of stupor. Death occurred May 17.

Autopsy (at the Philadelphia Hospital, May 18, thirty hours after death).—The body of an emaciated negro. The abdomen is markedly retracted over its whole extent. The muscles of the abdominal wall are firmly contracted, and on section are of a dark slaty-red color (post-mortem change?). There is very little subcutaneous fat. Rigor mortis is well marked.

Abdominal Cavity.—There is a small amount of clear fluid. No evidence of tuberculosis upon any of the peritoneal surfaces. The liver reaches to the fifth interspace above, and extends barely to the costal margin in the midclavicular line. Behind the pancreas, and lying upon the body of the first lumbar vertebra, is a rounded tumor. This is retroperitoneal, and is opposite the origin of the seventh costal cartilage. The inferior vena cava and the nerves of the solar plexus lie upon its anterior surface. This tumor measures six centimetres in its antero-posterior diameter and eight centimetres in its vertical diameter. On dissection, it is found to be a saccular aneurism of the abdominal aorta. The coeliac axis is given off immediately above the sac, and is adherent to it. The superior mesenteric artery comes from the aorta immediately below it. The left renal artery arises from the aorta directly behind the opening of the sac, and the right renal artery is given off from the sac itself. Upon opening the aorta the mouth of the dilatation is found to be clearly defined, and measures three by two centimetres. The long diameter of the opening is in the same direction as that of the artery. The sac is entirely filled with a red and firm coagulum. This has a definite, laminated structure, which is especially marked in the portion in relation with the aneurismal wall.

When the right renal artery is opened, it is seen to contain a hard, white thrombus that appears to totally occlude the artery for a distance of eighteen millimetres from its point of exit from the aneurism. This thrombus mass is closely adherent to the arterial wall, from which it can be stripped with difficulty. It is firm and

resisting and has evidently undergone fibrous change. The artery and its branches to the distal side of the thrombus are filled with softer red coagula, until the kidney substance is reached, when the coagula cease, and the vessels are free from obstruction. The left renal artery is normal. The intima of the abdominal and thoracic aorta shows many areas of fibrous change.

The connective-tissue envelope of the aorta was stripped off down to the aneurism, and at one portion of the sac was found to constitute its only covering. At other points the coats of the artery appear to be intact. The inferior vena cava lies directly to the right of the tumor and receives the left renal vein, that crosses the tumor to join it and is much dilated, measuring two centimetres in diameter at its widest point. The vein of the right kidney is normal.

Pleural Sacs.—The right is almost entirely obliterated by firm adhesions. The left has a few adhesions posteriorly at the apex.

Lungs.—Hypostatic congestion and œdema of the lower lobes on both sides. Otherwise nothing of interest.

Pericardium.—Normal.

Heart.—Full of liquid blood. The left ventricle is firmly contracted. Its myocardium is of fairly good texture and is much hypertrophied. The wall of the left ventricle measures twenty-four millimetres in thickness. There is considerable atheroma of the aorta directly above the semilunar valves, but the leaflets themselves are not affected. There is slight fibrous thickening of the free edges of the mitral leaflets, but the valve appears competent. The right ventricle is dilated and its myocardium is somewhat hypertrophied. It measures six millimetres in thickness. Valves of the right heart are normal. The weight of the heart is four hundred and forty grammes.

Spleen.—Small and is much congested. There is evidence of considerable increase in connective tissue. Its weight is sixty grammes. Dimensions: $9 \times 7 \times 1$ centimetres.

Suprarenal Capsules.—Normal.

Left Kidney.—Somewhat enlarged and measures $12.5 \times 9 \times 3$ centimetres. The capsule strips readily. The organ is somewhat flabby. The stellate veins are plainly seen. The cortex is swollen and is generally of a pale yellow color. The pyramids and medullary rays are congested.

Right Kidney.—Is smaller than usual, and measures $11 \times 6.5 \times 3$ centimetres. It is intensely congested and drips blood from the section. The capsule is somewhat adherent, and there are several small cysts upon the surface under it. The cortex is contracted and its consistency is increased. The cortex and pyramids are uniformly congested and dark-red in color.

Ureters and Bladder.—Normal.

Pancreas.—Normal.

Small Intestine.—Normal. No evidence of tuberculosis.

Stomach and Duodenum.—Nothing of interest is noted.

Colon and Rectum.—There is a large amount of fæces in scybalous masses. Both show irregular areas of intense congestion. The mucous membrane is covered by tenacious mucus. In the rectum are numerous hemorrhages into the mucous membrane, which average two centimetres in diameter. The impression is given that such areas are the result of pressure caused by the fæcal masses.

Liver.—Somewhat pale and irregularly mottled by yellowish areas. On section there is seen to be considerable perilobular congestion, and the parenchyma is pale with scattered yellow spots that appear fatty.

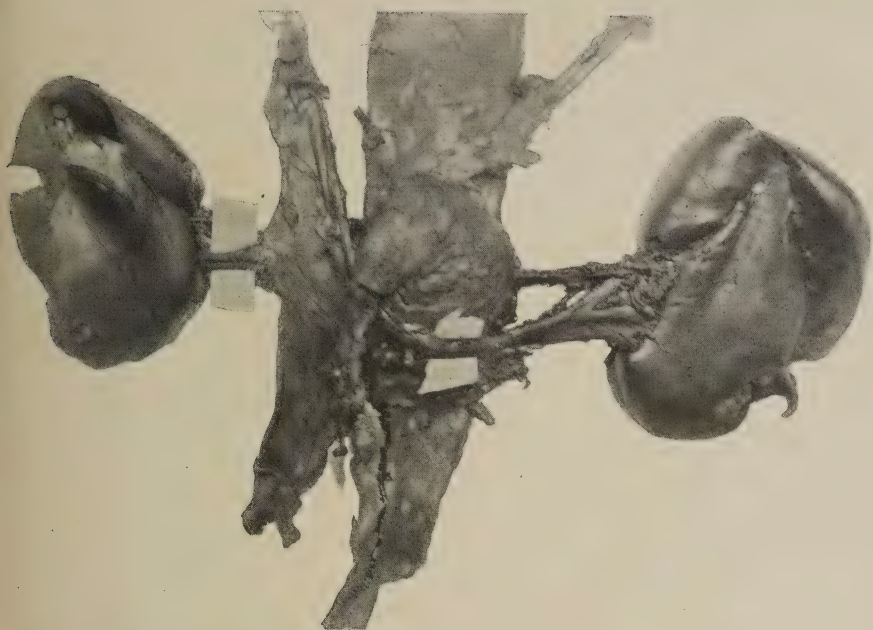
Gall-ducts are patulous and are not dilated.

Gall-Bladder.—Normal.

Brain, Spinal Cord, and their Membranes.—Normal.

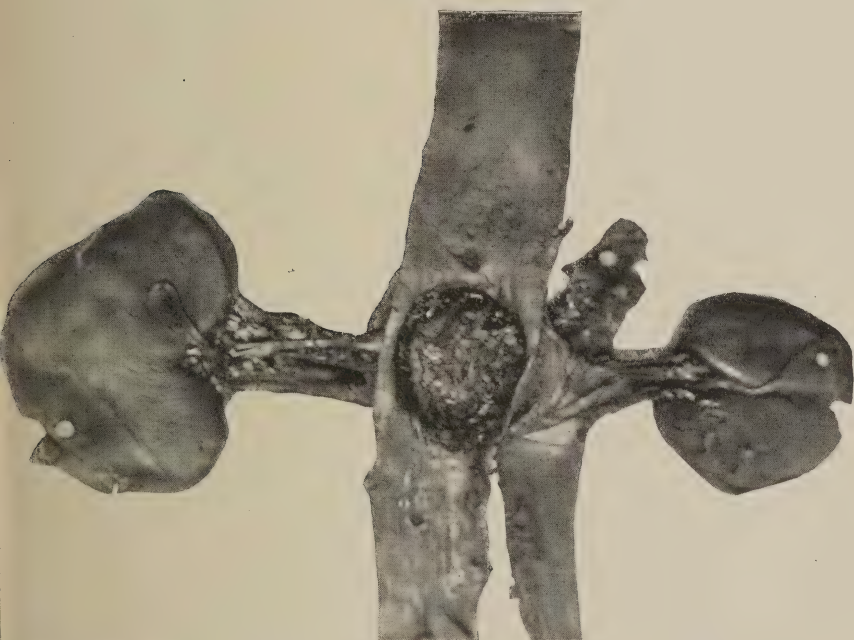
Microscopical Examination: Left Kidney.—There is some increase of the connec-

FIG. 1.



Anterior view of the abdominal aorta, inferior vena cava, and kidneys. The right renal vein is dilated. The celiac axis is dissected away from the aneurism, and is seen above and to the right. The difference in size of the kidneys is well shown.

FIG. 2.



Posterior view. The opening of the aneurism is shown with the laminated coagulum. The aorta is open on its posterior surface. The right renal artery comes from the trunk of the aorta; the left renal artery from the aneurismal sac.

tive-tissue elements, as well as evidences of an acute inflammatory process. The glomeruli, as a rule, are swollen, the capillaries are dilated, and the connective tissue of the tufts shows a considerable amount of round-cell infiltration. In places the tufts have undergone a hyaline degeneration that appears to commence in the capillary walls. The Malpighian bodies become swollen and homogeneous with fragmentation and, occasionally, complete loss of the nuclei. The hyaline material stains poorly with carmine, and when the process is not too advanced the faint outlines of the individual capillaries can still be seen. The cells of the tubules are much swollen throughout the cortex. In places there is much desquamation and an advanced fatty degeneration. The arterioles throughout the section show much increase of the connective tissue of the intima and adventitia. In many instances the endarteritic process has caused complete obliteration of the lumen of the vessel. Occasionally commencing hyaline degeneration is seen in such an obliterated arteriole. There are numerous small hemorrhages scattered through the cortex.

Right Kidney.—There is some increase in the connective tissue. This condition is rather more marked than in the left kidney. The Malpighian bodies are swollen and infiltrated, and in several places there is commencing hyaline degeneration, similar to that described above. The cells of the convoluted tubules have very generally undergone fatty degeneration, and in many instances have lost their nuclei, and have entirely broken down, the tubules being filled by granular detritus. The arterioles show an endarteritis with occasional obliteration of the smaller vessels, and commencing hyaline change. There are no hemorrhages in this kidney.

This case has seemed to us to be of interest, both on account of the rarity of thrombosis of the renal artery and the peculiarity of the clinical symptoms.

There was no attempt, macroscopically at least, at collateral circulation between the branches of the occluded renal artery and the small branches of the lumbar vessels supplying the perirenal connective tissue. Indeed, in the authorities that we have consulted, there is no mention of such an anastomosis, but from the close proximity of the terminal branches of the two sets of vessels, such a communication is conceivable. The only apparent results of the stoppage of the arterial supply were the intense congestion of the organ and the advanced degeneration of the cells of the convoluted tubules. It is remarkable that the left kidney maintained the urinary secretion as long as it did, in view of its diseased condition, and the evident inability of its fellow to assist it.

The previous history, that of the present disease, and the subjective symptoms did not aid us in the diagnosis. That of nephritis and uræmia was established by the results of the urinary examination, in connection with the cerebral and gastric symptoms, which were looked upon as uræmic.

Of great interest and difficult to explain were the markedly hard and retracted abdominal walls. The emaciation of the subject led to the suspicion of possible tubercular peritonitis or gastric carcinoma. Such remarkable retraction is seldom seen except as the result of peritoneal irritation in an aged subject. It is known to occur, of course, in meningitis of childhood.

The great amount of sclerosis throughout the whole arterial system may perhaps be explained by alcoholism, though the extensive endarteritis of the smaller vessels of the kidney suggests a possible syphilitic origin.

THE TREATMENT OF HÆMOPTYSIS.¹

BY R. H. BABCOCK, M.D.,

Chicago.

IN the early stage hemorrhage from the lungs is, in most instances, the result of active hyperæmia, and ceases so soon as the too active flow of blood to the lungs is corrected. When the hemorrhage arises from the ulceration or rupture of a pulmonary artery, either the opening must be closed by the contraction of the vascular coats or by the formation of a coagulum. Hence the administration of ergot, acetate of lead, gallic acid, and the like. But do these remedies accomplish the end sought? The effect of ergot is either denied altogether or considered doubtful by many clinicians. Openchowsky claims to have demonstrated, by means of a manometer introduced into the pulmonary arteries of lower animals, that drugs which affect blood-pressure within the aortic arterial system exert no effect upon the pulmonary arteries, except indirectly through their influence over aortic blood-pressure. Landois states that "contraction of small arteries, which causes an increase of blood-pressure in the systemic circulation, also raises the pressure in the pulmonic circuit, because more blood flows to the right side of the heart." Also, that the "vasomotor system has much less effect upon the pulmonary blood-vessels than upon those of the systemic circulation."

These considerations make it probable that ergot not only does not produce contraction of the pulmonary capillaries, but, through its constriction of the systemic arterioles, raises blood-pressure within the pulmonic system, and would theoretically aggravate rather than ameliorate hæmoptysis in the stage of excavation. The application of ice to the chest is stated by Landois and Winternitz to produce contraction of pulmonic capillaries, and its employment is, of course, based on this theory. Its effect cannot be localized, and it may be applied indifferently to various parts of the chest instead of nearly over the probable seat of hemorrhage. Indeed, Winternitz advocates the application of ice-bags to the supraclavicular spaces. It seems to me that the surest method of producing contraction of the pulmonary blood-vessels is by lessening the amount of blood flowing through them, if, indeed, that be at all possible, and that this is best accomplished by dilatation of the systemic arterioles,—in other words, bleed the patient into his own vessels. Furthermore, the retardation of the circulation favors the coagulation of the blood at the seat of hemorrhage. To meet this

¹ Read at the meeting of the American Climatological Association at Lakewood, May 13, 1896.

twofold indication arterial and cardiac depressants are employed. Aconite and veratrum viride produce arterial relaxation and slow the pulse-rate, but do this chiefly through their effect upon the myocardium. There is, therefore, certain danger of too greatly weakening the heart's action, and a drug which will produce vasomotor dilatation primarily and a subordinate degree of cardiac asthenia is preferable. Such a remedy is ipecac, and, administered in doses sufficient to maintain nausea, it is not only theoretically but empirically useful. The power of increasing the coagulability of the blood claimed for gallic acid is questionable, and the vasomotor-constrictor effect of tannic acid, acetate of lead, and mineral acids is open to the same theoretical objection as is ergot.

In conclusion, permit me briefly to state the treatment I employ. For the hæmoptysis of active hyperæmia I quiet the cough,—preferably by phosphate of codeine, by hypodermic injections or by the mouth; prescribe syrup of ipecac in frequent doses until nausea is produced, and order an efficient but not severe aperient, preferably Hunyadi or Rubinat water. If the hemorrhage be within a cavity and profuse, I order the immediate injection, hypodermically, of one-fiftieth or even one-twenty-fifth of a grain of sulphate of atropine. It is rarely my lot to reach the bedside during such an attack, but in cases in which profuse hæmoptysis is likely to recur, I leave orders with the nurse to resort at once to this treatment. This dose promptly produces pronounced physiological effects, but is not dangerous, and the increase of the heart's rate and vigor is offset by the vasomotor paresis occasioned, which diverts the blood to the periphery. It may be urged also that the effect of a full dose of atropine corresponds to that of the application of heat to the surface of the body.

Schueller's experiments with animals showed that contraction of the internal vessels promptly follows the application of heat to the integument, as of the abdomen. It may be that the flushing of the skin caused by atropine acts like the application of heat by producing contraction of internal, and therefore pulmonic, vessels. If anything will promptly arrest pulmonary hemorrhage, I believe it is atropine administered in this way. The subsequent treatment is all directed to the maintenance of the effect obtained by the atropine, and consists essentially of ipecac, codeine, and laxatives in doses varying to suit the requirements of each case. It goes without saying that absolute physical and mental rest is insisted upon, and the diet is light and unstimulating. In a word, I believe that when our efforts have been directed in keeping the lungs quiet and the blood in the periphery of the body, we have done all that can be done for the relief of hæmoptysis; nature must do the rest.

REVIEW OF MEDICINE.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY
D. J. EVANS, M.D.

Local Hot-Air Treatment in Rheumatism and Allied Affections. (Tallerman-Sheffield.) (*Lancet*, August 29, 1886.) By W. Knowsley Sibley, M.D.

The dry hot-air method of treatment was brought to the writer's notice in August, 1894, when the "Tallerman-Sheffield localized hot-air apparatus" was introduced into the Northwest London Hospital. He has employed this treatment in a large variety of cases, and considers that its value is not merely a temporary one, but is of a more or less permanent nature.

This apparatus consists of a copper chamber, generally cylindrical, of various shapes and sizes, so that the limbs, whole or in part, can be inserted and treated locally. The contained air is maintained in a dry condition during treatment; the temperature is varied at will, and is indicated by a thermometer, the bulb of which is passed into the chamber to the level of the part under treatment, and the scale is read on the outside. The heating agency used is gas or oil. An arrangement of asbestos allows of the suspending or resting of the limb during treatment.

The patient, suitably clad in flannel to encourage free perspiration and to prevent too much radiation of heat from the body, suffers no inconvenience or discomfort from the high temperature. The treatment lasts from fifty minutes to an hour. The temperature is usually about 150° F. when the part is first put into the chamber, and this is gradually raised to 220° F., and thence upward, in some cases to as high as 300° F. When the treatment is required to act quickly as an anodyne the temperature is rapidly raised to 260° or 280° F. But under ordinary circumstances it is gradually raised and a general free perspiration breaks out over the whole body; at the same time the body temperature is temporarily raised from $\frac{1}{2}^{\circ}$ to 3° F., a physiological effect hitherto regarded as impossible to be obtained. The pulse increases in frequency, and to a less marked extent the respiration. A few minutes after the operation is completed the pulse, respiration, and temperature return to the normal or previous condition. Usually, about an hour after treatment, the pulse is found to be slower and stronger

than it was before treatment. Pain is almost at once relieved, and the parts soon become more lax and supple. When the limb is first removed there is often a transient erythematous blush. After the bath the whole body is briskly and lightly rubbed down with a dry towel and the limb sometimes gently massaged with olive or other oil.

With regard to the physiology of the processes the author states that, *locally*, the heat produces dilatation of all the cutaneous vessels and free circulation through the parts, and at the same time there is a marked stimulation of the nutrition of the cutaneous nerves; there is free perspiration of an acid sweat; and relief from pain is almost at once apparent. *Generally*, there is profuse perspiration and dilatation of vessels; increase of the rate of the pulse and force of the heart's action; increase of the respiratory movements; and an increase in the body temperature often of 2° or 3° F.

No unsatisfactory result has followed the use of this treatment, although many of the patients were old and debilitated, and in some cases the objective disease was attended by heart and other visceral complications.

The following case bears testimony in regard to the efficacy of this treatment: A woman, sixty-four years of age, came under treatment for arthritis deformans of four and a half years' duration. The finger-joints of both hands were greatly enlarged, very painful, and tender; it was impossible to close or separate the fingers. The movement of the wrists was also very limited and the right elbow was fixed at a right angle. Both the knees and the shoulders were enlarged and painful. The patient could not dress or feed herself. After the ninth bath the patient was so much relieved that she resumed her former occupation as a dress-maker and was able to walk up-stairs and down-stairs with comparative ease. After twenty baths she considered herself cured.

Similar hopeless cases of this disease are detailed, and the writer says that he has never seen results so immediate and satisfactory produced by any other treatment. In a number of cases of rheumatism, subacute and chronic, and of sciatica the patients were equally benefited.

Mental Therapeutics. (*Lancet*, August 29, 1896.) By A. T. Schofield, M.D.

The therapeutical influence of the mind on the body the author considers of greater practical value in the treatment of disease than has been accorded to it. Neglect of its real value he ascribes to the fear which physicians have of injuring their reputation, because mental therapeutics have been heretofore the *modus operandi* of charlatans.

A discussion of the "mind," and what is known of its relation to the body, is followed by information in regard to the practical bearing of this knowledge on disease.

The conscious mind appears to the writer to be only a very small part of the whole psychic force in us; a very small part of what he terms a vast subconscious mind on which it rests. The conscious mind has its seat in

the cortex only; the unconscious mind is connected with all life that lies below, including even reflex action. The subconscious mind is on a lower plane than the conscious, and works largely in grooves of habit, and follows closely change of associations and sensation; but its powers far exceed in the body those of the conscious mind.

The new science relating to our protective organisms shows that they can carry on without erring a thousand complicated and apparently purposive operations, and form chemical combinations that no chemist can compass. The subconscious mind takes up conscious acts and transforms them into unconscious habits. Ease and perfection in any pursuit entirely depend upon the degree in which it ceases to be connected with consciousness. It is likely that when habits or artificial reflexes are established in the brain the current of sensation and ensuing motion never goes up to the cortex at all for orders from the conscious mind, the action being short-circuited in the middle brain or basal ganglia. Sights and sounds frequently repeated are arrested in our unconscious brain and not allowed to rise to the level of consciousness. The unconscious mind is also the active agent in all voluntary conscious actions.

But the subconscious mind can do greater wonders than these. It not only carries on all the work of the body, but it can use unconsciously the highest cortical centres of thought that are ordinarily worked by the conscious mind. If the conscious mind gives the cortex some work to do, such as solving a problem, recalling a sound, a name, or a place, meanwhile occupying itself completely in some other way, the subconscious mind will step in and do the work and give the answer in a surprising way. It is probable that the subconscious mind is ever working in the cortical region in the way of deepening impressions and memories.

But it will do more than this. Of all the thousands of impressions that are being received in the cortex from various parts of the body and from our special senses, but very few are even noticed by the conscious mind, though all are registered subconsciously. We find ourselves unconsciously repeating the words or humming the tune of a new song not noticed particularly.

Our conscious mind, as compared with the unconscious mind, has been likened to the visible spectrum of the sun's rays, as compared to the invisible part which stretches indefinitely on either side. We may say that the mind includes not only the visible or conscious part, and what we have termed the subconscious that lies below or at the red end, but the supraconscious mind that lies beyond at the other end,—all the regions of higher soul and spirit life, of which we are only at times vaguely conscious, but which always exist and contain our most abstract and spiritual faculties.

The powers of the unconscious mind are seen in a remarkable way in insanity. The sane man is one in whom the conscious mind rules. In an unsound mind the supraconscious or subconscious steps in, and overpowering

the conscious mind produces ecstatic visions and phantasms on the one man or coarse and sensual conduct on the other. In defective intellects, where the conscious mind is weak, the power of the subconscious mind is remarkably seen. When consciousness is in abeyance, as in a dream or revery, or artificially, as in hypnotism or narcotism, the unconscious mind emerges from its obscurity, and ocular and other impressions unconsciously formed upon the brain are seen and noticed for the first time. If the unconscious mind be stimulated at such times it can exert extraordinary and apparently unlimited powers over the body. Once more, the unconscious mind is ever writing the record of the conscious mind on the body, in gait, in gesture, and in the lines of the face.

With mental therapeutics our field of action, while embracing the whole mind, is mainly the subconscious region, which not only can be treated without the knowledge of the *Ego*, but which can effect through its wonderful powers the nutrition and health of the body to an illimitable extent, and, indeed, is the real agent in most cures.

In disease, the cortex—the seat of conscious mind—is a special factor for good or evil. Every organ and function is represented there, and there brought into vital unity. Mental therapeutics can be applied to the body in one of three ways: (1) by the unconscious mind directly,—in spiritual or physical influences and surroundings; (2) by the unconscious mind acted on by the conscious indirectly,—in rousing faith in persons, remedies, or places; and (3) by the unconscious mind acted on by the conscious or direct effort,—in determination to get well, to shake off illness, ignore pain, etc. It is a powerful means of cure in all organic and inorganic diseases, while in hysteria and allied neuroses it is the only reliable means of permanent efficacy.

An illustration of cure by the second method is given as follows: At the siege of Breda, in 1625, the whole garrison was down with scurvy; the Prince of Orange smuggled into the town three small vials of essence of camphor, and his physician put three or four drops into a gallon of water, and the men recovered and saved the town.

In diseases of the nerves, as nerve irritation or nervousness and nervous debility, the brain is, as a rule, sound, and we can apply mental therapeutics unconsciously by change of scene, surroundings, etc., and consciously by direct influence and instruction. In hysteria the cause of the disease is entirely different. The nerve structures involved are probably what we may call ideal nerve centres,—that is, the seat of mental activity, conscious and unconscious. Hysteria often begins in some slight but real disease in a person with an ill-balanced or worn-out brain,—one in whom the subconscious mind has too much sway, so that its feelings ordinarily unnoticed are ever present to the consciousness. Such disease, therefore, long after it is well, continues to set up a train of associations that produces the true hysterical disease. As in child-training the unconscious power of environment and habit are far more effectual than conscious precept, so the

best cures of hysteria are effected in the same way through the unconscious mind.

The author regrets that this curative agent is so completely ignored, although its power is everywhere seen and felt. He concludes by saying that when these laws have become the subject of serious study, and when the whole science is better understood and earnestly taught in the profession, the misuse and abuse of this great therapeutic agent by ignorant quacks will largely cease and the true curative agent of nearly all diseases will at last stand revealed.

The Pathology of Itching and its Treatment by Large Doses of Calcium Chloride, with Illustrative Cases. (*Lancet*, August 1, 1896.) By Thomas D. Savill, M.D.

After presenting very fully the symptoms and characteristic phenomena of pruritus, the author enlarges upon the success he has attained in the use of calcium chloride in the treatment of this most troublesome affection. It has been shown that this drug has a very marked effect on the blood,—namely, increasing its coagulability. The distinct success the author has met with in thus relieving primary pruritus confirms the idea that the irritated state of the nerve-endings and fibrils which exists in this complaint, manifested by itching and tingling, is due to some change in the quality and composition of the blood. The paper is accompanied by a very elaborate table of cases thus successfully treated, with the remedies previously used without effect. In each case either a cure was made or great benefit obtained. The doses must be considerable—not less than twenty grains three times a day—and should be gradually increased; thirty or even forty grains have often succeeded where less have failed. As thirst frequently follows the administration of the drug, it is best to cover the salt taste with a drachm of tincture of orange-peel and one ounce of chloroform-water, in which form it is really an agreeable medicine, and would be well borne by children. The diet during its use should be restricted, no beer, sugar, or sweets being allowed, and meat only in moderate quantity. The recovery in some cases was retarded by neglecting this. The bowels should also be kept freely active. Although improvement is generally noted after the first dose, recovery sometimes does not take place until the blood has become saturated, the dosage being increased until this is accomplished. Upon recovery the dose should be gradually, not suddenly, reduced; in fact, the treatment should be continued for from one to three weeks after all symptoms have disappeared. In a few cases of long duration relief was obtained only during continuation of the drug; but a cure is more than probable, with persistence, even in these.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D.,

AND

J. P. ARNOLD, M.D.,

Assistant Demonstrator of Surgery in the University of Pennsylvania,

Medical Superintendent of the Presbyterian Hospital.

Four Laparotomies for Tuberculous Peritonitis in the same Patient.—D'Urso (*Il Policlin.*, June 1, 1896), continuing his paper on laparotomy for tuberculous peritonitis, reports the case of a girl, aged twenty, upon whom he performed laparotomy four times in six months, with the result that for the last four and a half months there has been no sign of recurrence, and the general health has been highly satisfactory. The illness had lasted some seven months; the first operation was done on December 27, 1894, the other operations were performed on January 20, April 24, and June 11, 1895, respectively. After each operation temporary relief was noticed. Careful microscopic examination of the affected peritoneum was made each time, and as a result of this the author affirms that cure takes place in these cases by leucocytic invasion, organization of fresh connective tissue, vascular new formation, and substitution of tuberculous tissue by inflammatory neo-formations. Washing out the peritoneal cavity does not act in virtue of any particular antiseptic or antituberculous property of the solution, but mechanically by setting up a certain amount of inflammation, and the washing assists this partly through the disturbance which the sponging out of the fluid necessitates. The case is very fully reported, and drawings of the histological appearance of the pieces of peritoneum at different stages are reproduced.—*British Medical Journal*, August 1, 1896.

A Case of Fatal Pelvic Injury in a Child in which a Collection of Blood in the Prevesical Space simulated Distention of the Bladder. (*British Medical Journal*, July 18, 1896.) By Herbert W. Page.

In a clinical lecture, at St. Mary's Hospital, Mr. Page details a case in which a boy, aged seven years, was admitted to the hospital in a state of collapse after having been run over by a vehicle in the street. The external injuries seemed to point to the fact that the wagon had passed in an upward direction over the right leg and thigh and had struck against the right side of the abdomen and chest. A few drops of blood trickled from the urethra. A soft catheter apparently passed into the bladder and drew off a few drops of blood. During the night it appeared that the bladder was distended up to the umbilicus, but a catheter passed failed to draw any urine. A suprapubic opening was made and a large quantity of clotted blood removed from what seemed to be the bladder. The child died of septicæmia in a few days.

The autopsy showed the urethra torn across at the apex of the prostate. The prevesical space was filled with infected blood-clot mixed with decomposing urine. The suprapubic opening had not entered the bladder, but had simply opened up the prevesical effusion of blood. The catheter had also gone into this effusion and had not entered the bladder. There were three distinct fractures of the pelvic bones.

Had the case been diagnosed and perineal drainage instituted, it is possible the boy's life might have been saved.

The possibility of the occurrence of this condition in pelvic injuries urges the necessity of the surgeon keeping the point in mind when called upon to treat injuries in this region.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
New York City,

WM. G. SPILLER, M.D.,
Philadelphia.

Buccal and Cutaneous Ulcerations, Œdema, Erythema Nodosum, and Orchitis of Hysterical Origin. (*Bulletins et Mémoires de la Société médicale des Hôpitaux de Paris*, June 4, 1896.) By Fernand Vidal, M.D.

A man of fifty-five years had had gonorrhœa previous to 1891. Since 1894, although no trace of gonorrhœa could be found, he had had numerous attacks of epididymitis on one or the other side, accompanied by erythema nodosum on the lower limbs, lasting only a few days. In 1895 œdema of the left arm with cyanosis was observed several times after tests of sensation. In September, 1895, he was seized with violent lumbar pains from no known cause, and a considerable amount of albumin was found in the urine during four days. The alarm produced by these symptoms caused a convulsive attack lasting two hours, which was followed by temporary œdema of the right lower limb without pain and without fever. The erythema nodosum appears now on the lower limbs after the least excess or fatigue. Once only Dr. Vidal has been able himself to observe this orchitis. It appeared suddenly, the right testicle was very painful, hard on palpation, double the ordinary size, and the pain radiated along the spermatic cord and into the hypogastric region of the corresponding side. There was no rise of temperature. The following day the testicle was smaller and less painful; after three days all pain had ceased and only induration of the epididymis on each side—the remains of repeated inflammation—could be noticed.

Dr. Vidal observed also that buccal ulcerations accompanied each time the attacks of erythema nodosum. Most of the physicians who had seen this patient ascribed all these trophic troubles to hysteria. Simultaneity

of the symptoms was in favor of this view. The patient had also irregular patches of cutaneous hyperæsthesia, and an extremely sensitive spot in the sacral region. The albuminuria may have been due to hysterical congestion. The testicles were not atrophied and not indurated after the attacks. The tumefaction of the testicle was not due to a serous effusion into the tunica vaginalis.

The Spinal Lesions caused by the Tetanus Toxine. (*Comptes Rendus des Séances de la Société de Biologie*, July 4, 1896.) By G. Marinesco, M.D.

Marinesco examined the spinal cord from three guinea-pigs which had been inoculated with the tetanus toxine. He found diffuse hemorrhages in the gray substance most numerous in the anterior horns, the chromatophilic elements of the nerve-cells smaller and altered in shape, in some places changed into granules scattered through the cell-body. In certain preparations these elements had disappeared at the periphery of the cells, as has been seen also in hydrophobia and anæmia of the spinal cord from compression of the abdominal aorta; in other preparations they had disappeared also at other parts. The protoplasmic processes presented lesions similar to those of the cell-body. The achromatic substance was more stained than is usual. In some preparations where the configuration was preserved the entire cell was deeply stained and the altered chromatophilic elements could scarcely be seen. The changes were found in the cells of the posterior as well as of the anterior horns. In the earlier stages the nuclei were not much affected, but in the later their contour was less distinct, the coloration more intense, and the nuclear net-work had disappeared. The neuroglia-cells were larger. After the tetanus had become chronic degenerative lesions were found in the white substance and were probably due to alteration of the column-cells.

The Intramedullary Course of the Posterior Roots in the Cervical and Superior Thoracic Regions of the Spinal Cord. (*Comptes Rendus des Séances de la Société de Biologie*, June 27, 1896.) By Professor Dejerine and A. Thomas, M.D.

A woman who had been infected with syphilis nearly twenty years previously began to suffer from violent pains in the left shoulder and arm; after four months paralysis and atrophy were noticed in the muscles of the thenar and hypothenar eminences and in the interossei of the left side. The flexors of the fingers and the deltoid were weakened; the supinator longus, the radial muscles, extensors of the fingers, biceps, triceps, and the brachialis anticus were still vigorous. The olecranon reflex was absent. Sensation was diminished in all qualities on the internal border of the forearm and hand in the region corresponding to the distribution of the ulnar and internal cutaneous nerve. Faradic excitability was lessened

chiefly in the ulnar nerve, and there was partial reaction of degeneration. The ulnar nerve also was very painful on pressure.

Sight had been lost in the left eye simultaneously with the appearance of right-sided hemiplegia associated with paralysis of the left third nerve.

At the autopsy a very small tumor was found upon the left optic nerve, another upon the left oculomotorius. In the cord the right pyramidal tract was degenerated. The eighth cervical and especially the anterior root of the first thoracic nerve of the left side were degenerated, the dura was thickened at this part by a gummatous infiltration. The left column of Burdach above the lesion was much degenerated, and at the level of the fourth cervical roots the degenerated area involved the cornu-commisural zone. The column of Goll was not involved. Below the lesion, at the level of the second thoracic roots, was a small area of degeneration near the left posterior horn, which probably represented the descending branches of the degenerated posterior roots. The left anterior horn, at the level of the eighth cervical and first thoracic roots, was small and contained few cells, as the result of retrograde degeneration.

This case offers an explanation for some of the syphilitic ulnar paralyses. The ulnar nerve was chiefly involved, but other branches of the brachial plexus were not intact. The eighth cervical and first thoracic roots furnish fibres to the ulnar and internal cutaneous, but also to the median, radial, and circumflex nerves.

Pathology of Multiple Sclerosis. (*Arbeiten aus dem Institut für Anatomie und Physiologie*, No. iv., edited by Professor Obersteiner.) By Emil Redlich, M.D.

Redlich has examined microscopically about twenty cases of multiple sclerosis. There are three chronic forms :

1. The dense sclerotic patches as seen especially in the posterior columns. These in transverse sections of the cord are formed of granules or points, very fine parallel fibrillæ and neuroglia-cells containing two or more nuclei or even no nucleus at all. The processes of these cells are usually very distinct, more numerous than is normal, and appear thick and shiny. Many of the fibrillæ, especially the coarser, can be traced to these cells, but appear often merely to pass through them, as Weigert has described for the normal neuroglia. In longitudinal sections these fibrillæ have a vertical, parallel, dense arrangement, and are slightly wavy, the same is seen in transverse sections about the vessels. The granular appearance is due to transverse section of the fibrillæ. Scattered nerve-fibres are found more or less altered in the sclerotic mass, most of them show changes in the medullary sheaths, which may even be absent; the axis-cylinders may be normal, usually, however, are either swollen or diminished in size. These sclerotic foci pass by gradual diminution in the size of the trabeculæ into normal tissue. Few nerve-fibres are found in the centre of such foci.

2. A second type consists of coarse neuroglial trabeculæ which do not

form distinct foci, they are formed by a thickening of the neuroglia normally present, partly by division of the neuroglia-cells, as indicated by several nuclei in one cell, but chiefly by increase in the neuroglial fibres. It is impossible to decide whether all the fibrillæ are in connection with the neuroglia-cells. Weigert has shown that in adult man the fibrillæ completely lose their connection with these cells. There is no proof for the hypothesis that these fibrillæ are formed from the medullary sheaths or axis-cylinders, it is more probable that they are true neuroglial fibres. The walls of the vessels within the foci are often much thickened, poor in cells, and have undergone hyaline degeneration. In the larger vessels usually all three layers are involved and the lumen is narrowed. The neuroglia about the vessel is much thickened. It is not true that in the centre of every focus an altered vessel may be found. These sclerosed vessels are often irregularly located within the foci, and areas of sclerosis are found without greatly diseased vessels. The vascular changes cannot therefore be considered primary.

3. A third form consists of a loose net-work of slightly thickened trabeculæ with neuroglia-cells at the points of intersection. The meshes are empty. Such foci stained with carmine appear light, and are usually near the dense sclerotic patches and the periphery of the cord. They are probably due to a relatively rapid destruction of nerve-fibres.

The patches in multiple sclerosis are often symmetrical, are noticed quite frequently on both sides of the anterior fissure, do not correspond to the territory of any of the vessels, and are less important in the lower parts of the cord. The motor ganglion-cells are very resistant to the sclerotic process.

In the subacute forms the changes are somewhat different. Fatty granular cells and other products of the acute degeneration of the myeline are noticed; the formation of large spaces is characteristic. The trabeculæ are sometimes a little thickened. The vessels are distended and their walls infiltrated with mononuclear, probably chiefly granular cells.

Sclerotic foci are common in the pons, but rare in the mid- and inter-brain, and not uncommon in the medullary substance of the cerebral hemispheres, they have never been observed in the peripheral nerves; there is nothing histologically characteristic about them except their arrangement.

The process is not truly inflammatory, as there are no extravasations nor swelling of the tissue; it is more degenerative, and probably begins in the nervous elements.

Acute Myelitis from the Toxines of Streptococci and Staphylococci. (*Comptes Rendus des Séances de la Société de Biologie*, May 30, 1896.) By H. Claude, M.D.

Two guinea-pigs were inoculated beneath the skin of one posterior paw with filtered culture of streptococci and staphylococci. Acute myelitis resulted, characterized in one case by spastic, in the other by flaccid paraplegia.

The spinal lesions consisted of small hemorrhagic foci in the gray substance and accumulations of round cells, especially about the ganglion-cells, some of which they had penetrated. The ganglion-cells not thus invaded presented alterations more or less accentuated, consisting of disintegration of the protoplasm, formation of vacuoles, and changes in the situation and structure of the nucleus. The white matter was in general intact. The small vessels presented marked inflammatory lesions, even thrombosis. The nerves examined appeared normal. Inoculation with the same bouillon in other animals did not produce paralysis.

There have been comparatively few cases recorded of myelitis from microbic intoxication. Intense alterations occur in the nervous system, due to toxines alone, as seen in infectious diseases from products elaborated within the body by the micro-organisms. The streptococci and staphylococci are probably the cause of many cases of myelitis.

Action of the Streptococcus and its Toxines upon the Nerves, the Spinal Ganglia, and the Spinal Cord. (*Comptes Rendus des Séances de la Société de Biologie*, May 23, 1896.) By Professor E. A. Homén (Finland).

Dr. Homén employed in his experiments streptococci which he had rendered especially virulent by inoculation from one animal to another, and by exposure of the inoculated animals to a low temperature. He injected the micro-organisms from bouillon culture directly into the sciatic nerve just above the knee or into the spinal cord. Dr. Laitinen performed similar experiments with the toxine.

In the animals inoculated with the micro-organisms a little caseopurulent infiltration was noticed about the nerve at the point of injection, and if examination was made within the first week the vessels of the nerve were found injected, the nerve was swollen and cedematous, the spinal meninges, especially of the lumbar region, were also often found injected. Other portions of the body revealed the effects of the microbic invasion.

After injection of the toxine local irritation within this period was unusual, or at least of very mild degree, the vessels of the nerve, as a rule, were not injected, and the nerve was not as swollen as after injection with the micro-organisms.

The histological alterations due to inoculation with micro-organisms were found throughout the nerve, and usually in the corresponding spinal ganglia and roots, as well as in the cord. Within the nerve the intensity of the process diminished in proportion to the distance from the point of inoculation. The changes consisted of round-cell infiltration, small hemorrhages, and destruction of nerve-fibres; in the spinal ganglia and roots these were relatively slight and more pronounced in the posterior roots than in the anterior. The lesions were least noticeable in the cord, although more evident in the lumbar region than elsewhere, and consisted of injection, small hemorrhages, some leucocytic infiltration, alteration of nerve-

fibres in small patches, especially at the periphery of the cord and along the posterior septum, and in some cases destruction of a portion of the cells of the anterior horns.

In animals inoculated with toxine there was less infiltration of leucocytes in the nerves, but the changes in the spinal cord and posterior ganglia were about the same.

Micro-organisms were detected in the nerves and cord by means of cultures and the microscope. These experiments are in favor of the opinion that many spinal affections are of a toxic or infectious nature, and of the possibility of the much-disputed ascending neuritis.

Hemorrhage and Œdema of the Brain. (*Bulletins et Mémoires de la Société médicale des Hôpitaux de Paris*, June 4, 1896.)

Gilles de la Tourette reports two cases of apoplexy which he considers as hysterical. Trophic lesions, such as œdema and hemorrhage, as observed elsewhere in the body, may exist in the brain, according to his view. Hysterical hæmatemesis, hæmoptysis, and ecchymosis are well known; there is no reason why similar lesions should not be found within the cranial cavity. There was no autopsy in either of his cases; if there had been, the hysterical nature of a hemorrhage could not have been demonstrated in this way.

These remarks led to the report of two cases of transitory infantile hemiplegia by Drs. Sevestre and Rendu, which they believe were due to cerebral congestion and œdema, and of two cases of Jacksonian epilepsy by Drs. Siredey and Hayem, in each of which the diagnosis of brain tumor seemed assured, but in which no lesions were found at the autopsy.

CLIMATOLOGY.

IN CHARGE OF GUY HINSDALE, M.D.,

Philadelphia.

Rarity of Pneumonia in Florida. (*Transactions of the American Climatological Association*, 1896.) By Dr. Frank Fremont Smith.

Dr. Smith showed that pneumonia is a very rare disease even among the colored population. At the Alicia Hospital, St. Augustine, where the entire number of cases treated in six years preceding May 1, 1896, was seven hundred and twenty, the whole number of cases of pneumonia is five, three of which were importations.

The official record of St. Augustine from May 1, 1878, to February 1, 1892, indicates one thousand four hundred and thirty-five deaths from all causes; among these forty deaths were from pneumonia. Dr. Anderson, of St. Augustine, reported that he had not seen more than six cases of croupous pneumonia in twenty-five years' practice.

POINT PINELLAS, FLORIDA.—This is a peninsula on the west coast, be-

tween Tampa Bay and the Gulf of Mexico. The bay sends various prolongations or minor bays into the coast and connects with the interior by rivers, bayous, or lakes. The climate of the whole region is mild and equable, and the soil fertile. The peninsula embraces above one hundred and sixty thousand acres, and is free from marshy ground and is bordered by a fine beach. The latitude $27^{\circ} 41'$ renders frost a rarity. Point Pinellas has a climate well adapted for cases of genito-urinary tuberculosis, being equable, warm, and not too dry; out-door life is possible to patients throughout the year, and there is abundant opportunity for amusement, especially on the protected bays. High, cold, dry climates are unsuitable for renal cases or for any cases where hepatic or pelvic congestions exist. The principal town on the peninsula is St. Petersburg, where visitors will find ample accommodations.

The Climate of New Mexico. (*Medical Record*, June 13, 1896.)
By Francis W. Gallagher, M.D.

Las Vegas, at an altitude of six thousand five hundred feet, is a busy modern city with excellent accommodations for visitors. The springs are renowned and the baths much used. Dr. Gallagher calls attention to the neglected and almost unknown Mexican village of Socorro, which has fine possibilities as a resort. It is situated on a plain which slopes from the base of the Socorro Mountain a mile distant to the Rio Grande. The water supplying the town comes from two hot springs in the mountain in a volume sufficient to supply a town of thirty thousand persons with water for household use. The water is free from mineral ingredients or organic matter. Elevation four thousand five hundred feet. Unfortunately, there are at present no adequate accommodations. Las Cruces is one hundred and thirty miles south of Socorro, in the Mesilla Valley, but at an altitude of four thousand feet. It abounds in fruits and wines, and is stated to be the best winter point in the Territory.

The Waters of Glenwood Springs, Colorado. (*Medical Record*, June 13, 1896.) By Henry H. Schroeder, M.D.

The author states that the effects of prolonged hot and vapor baths are produced by the stimulation of the sensory cutaneous nerves, which exercise an important influence on the most complicated processes of the organism by means of the reflex actions transmitted through the central nervous system. Anything which tends, then, to intensify the stimulation of the peripheral nerves will favor greater activity of the different vital functions. That saline ingredients act as additional excitants may easily be demonstrated by noting the greater redness of the skin after a hot brine bath as compared with its appearance after a plain hot bath. Paalzow's experiments prove that a strong stimulation to the skin produces a reflex conversion of tissue, indicated by an increased consumption of oxygen and excretion of carbonic acid. Brunton recommends the addition of common salt to the water to

increase the stimulation of the skin and the amount of after-reaction. The gratifying results obtained at Glenwood I fully believe to be largely due to the decided stimulation of the skin occasioned by the extraordinarily large amount of mineral ingredients in the water.

These waters contain one thousand two hundred and fifty grains of salts to the gallon, chiefly sodium chloride. Carbonic acid gas and hydrogen disulphide are given off in large amounts at the springs. These are fifty in number, but only a few are utilized, yielding, however, two thousand gallons of water per minute. The baths are of great value in the treatment of chronic rheumatism.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

FAILURE OF ATTENDING PHYSICIAN TO SEND, AS PROMISED, A SPECIALIST TO ATTEND HIS PATIENT NOT MALPRACTICE.

IN an action by the plaintiff, Mrs. J., to recover damages for the loss of an eye, alleged to have been caused by the negligent and unskilful treatment of the defendants, her attending physicians, it appeared that they treated the plaintiff for typhoid fever, and that, as a result of the treatment, she recovered. While sick, the plaintiff's eye became affected, and she requested the defendants to send her an oculist, which they promised but neglected to do. An oculist, who was afterwards procured by another person, stated that he could do nothing, but that, if he had been called sooner, he might have effected a cure. It was decided that it was not the defendants' duty to provide the specialist, and, as the evidence failed to show that the injury to the plaintiff's eye was the result of the fever, the plaintiff was properly nonsuited.¹

The facts of the case, as they appear from the evidence produced at the trial, are as follows: In September and October, 1891, Mrs. J. was prostrate with typhoid fever in the city of E. She employed Drs. W. and C., a firm of physicians, practising their profession in that city, to attend upon and treat her for her disease. She was in their care for about two months. While she was lying sick, her left eye was attacked by an affection which finally deprived it of the power of sight. She brought this action against Drs. W. and C. to recover damages for the loss of the use of her eye, alleging that the deprivation was due to the unskilful treatment by the defend-

¹ Jones vs. W., 45 Pac. Rep. 234 (1896).

ants of the disease from which she was suffering. The evidence for the plaintiff consisted of her own testimony and that of two doctors,—one a physician in general practice, and the other an eye, ear, and throat specialist. Her testimony was that both the defendants were in attendance on her during her illness,—Dr. C. for the first three weeks, and Dr. W. afterwards,—and that, as the result of their treatment, she was cured of typhoid fever. She stated that while Dr. W. was attending her, she had a pain in her eye, and noticed that the sight was beginning to leave it, whereupon she feared the loss or partial loss of the sight through the fever, and asked him to send her an oculist, so that her eye might have proper care; but he laughed at her, and told her there was nothing the matter with her eye. However, on her repetition of the request, he promised to send her an oculist, but did not, stating he had forgotten the matter. At last the nurse who had charge of her telephoned for Dr. D., an oculist, who came in response to the message. She stated that Dr. D., upon examining her eye, said he could do nothing for her, but that, if she had sent for him sooner, he might have done something. Dr. H., the specialist, testified that he examined the plaintiff's eye in March, 1893. He said it showed a cataract almost completely formed, but that he was not able, from his examination, to determine its character, and would not undertake to say what caused it. The remaining witness, Dr. J., testified that he did not make the eye a specialty, but that he had helped specialists in his general practice to operate on cataracts. His testimony was that typhoid fever, in its severe forms, in some cases, leaves injurious effects upon the eye. He gave an instance of a lady, from the town of P., who was sick with typhoid fever, and whom he attended, and in whose case a cataract was the direct result of typhoid fever. He testified to an examination of the plaintiff's eye, but did not state what was the nature of his examination, or what it disclosed. Upon the foregoing testimony the plaintiff rested her case, and was nonsuited on motion of the defendants. And, in affirming this judgment of nonsuit, the District Court, on appeal, in an opinion by Mr. Justice Thomson, said, "The plaintiff employed the defendants to treat her for typhoid fever. There was no evidence, and, in fact, no complaint, that they did not bestow upon her all the attention and skill which the nature of the disease and her condition required. Indeed, she stated herself that she was cured of the fever as a result of their treatment. How far and under what circumstances they might be responsible for any after-effects of the disease we shall not inquire, because there was no evidence whatever that the injury to the plaintiff's eye was the result of the fever. The only charge in the complaint which was proven was that Dr. W. failed to send her an oculist after he had promised to do so. The defendants were employed to treat her for fever, and their employment imposed no duty upon them to provide her with a specialist for her eye. She seems to have had no difficulty in procuring one when she set about it, and presumably he could have been gotten just as readily at first. The nonsuit was properly granted, and the judgment will be affirmed."

BOOK REVIEWS.

ANNUAL MEDICAL AND SURGICAL REPORT OF THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK. Edited by Andrew J. McCosh, M.D., and Walter B. James, M.D. Vol. I., 1896. Knickerbocker Press, New York.

This year the Presbyterian Hospital of New York makes a new departure by publishing a report devoted entirely to a review of the medical and surgical work of the year. It contains, in addition to the usual statistical tables of cases admitted and discharged and list of operations performed, a series of articles by the physicians, surgeons, and pathologists of the hospital, giving the fruits of their experience with the more interesting cases. Many of the papers are of considerable interest, and a few of them have already appeared in the magazines. There is an exceptionally good series of genito-urinary cases, the pathology and surgery of the kidney, bladder, and prostate being well exploited. F. Tilden Brown describes his new and ingenious method for amputation at the hip-joint, and Fell's method of artificial respiration is again proven efficacious by the description of a number of cases in which it was practised, with O'Dwyer's modification, using an intubation-tube in place of the face-mask or tracheotomy-tube. The surgical papers rather overshadow the medical in bulk, but there is a very interesting paper on caisson disease, with observations on twenty-four patients admitted to the wards. A consideration of the amount of clinical material which is wasted, so far as educational purposes are concerned, in our large hospitals, should be an incentive to the staffs of other institutions to follow the example of the Presbyterian Hospital, and give the professional world at large just such reports as we have here.

H. R. W.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE RECTUM, ANUS, AND CONTIGUOUS TEXTURES. DESIGNED FOR PRACTITIONERS AND STUDENTS. By S. G. Grant, M.D. Philadelphia: F. A. Davis Company, 1896.

A practical and fairly comprehensive review of the teaching of the day on this subject. Not the least valuable articles are those contributed by Herbert Allingham on colotomy and cancer. A new departure is made in devoting a chapter to the subject of rectal diseases among railroad employés, calling attention to the prevalence of rectal affections among this class, irregular habits of life, maintenance of erect posture, and the constant jar being ascribed as etiological factors. The author is an advocate of the treatment of hemorrhoids by cautery, a method of treatment which is now widely and satisfactorily employed. There are a number of full-page colored illustrations, some of them, owing to brilliancy of coloring in subjects and background, being more striking than artistic. The work, as a whole, can be recommended to the profession as a safe guide to follow in the treatment of rectal diseases.

H. R. W.

A MANUAL OF OBSTETRICS. By W. A. Newman Dorland, A.M., M.D., Assistant Demonstrator of Obstetrics, University of Pennsylvania, etc. Philadelphia: W. B. Saunders, 1896.

In this small volume, of 750 pages, the author has carefully carried out his idea of a systematic presentation of the subject of obstetrics, as recognized by its leading

teachers. He divides the subject into physiological and pathological obstetrics, and takes up as nearly as possible under each of these the events as they occur.

This is an excellent arrangement for the student, but we think would be more so if the subdivisions, and especially the paragraphs, were more plainly marked.

The chapters on extra-uterine pregnancy, placenta prævia, the mechanism of normal labor, and dystocia are clear, concise, and well written. To the agitated subject of puerperal sepsis the author gives much space. "The pathological conditions of the fœtus" does not seem to be as carefully written as other parts of the book.

The diagnostic tables are a distinct feature. They are numerous and carefully prepared. The illustrations, although not profuse, are excellent, and well chosen to elucidate the subject. Altogether, we consider the book thoroughly practical and of particular advantage to the student.

I. H. G.

AN INQUIRY INTO THE DIFFICULTIES ENCOUNTERED IN THE REDUCTION OF DISLOCATIONS OF THE HIP. By Oscar H. Allis, M.D. Samuel D. Gross Prize Essay. Philadelphia, 1896.

Dr. Allis has fairly earned the honor conferred upon him by the trustees of the Gross Prize Fund. The essay which he has written is a contribution of lasting value to our fund of information on the above subject. Long and careful work in the dissecting-room has demonstrated that there was still something to be learned from the anatomical side, and the author has brought his well-known ingenuity into play in the solution of the problems met there, in experimental work as well as in the clinic-room. There is probably no department of surgery in which a knowledge of mechanical principles is so necessary as in the study of dislocations, and Dr. Allis abundantly proves his ability to handle the subject from this aspect. He attacks some time-honored views, as when he questions the possibility of the production of these dislocations by "thrust," and the existence of the obstacle to reduction afforded by the "slit in the capsule," but his reasoning here, as in the discussion of the relative merits of reduction by the "direct method" and "circumduction," in which he favors the former, is clear and forcible. We strongly recommend the book to all interested in the study of hip-injuries.

H. R. W.

NEW YORK EYE AND EAR INFIRMARY REPORTS. Vol. IV., Part I. The Knickerbocker Press, New York. 8vo, pp. 105. Price \$1.00.

This publication is made up of contributions by the surgeons, assistant surgeons, and house-staff of the infirmary, and the present volume has fourteen articles purely clinical in their scope, relating to diseases of the eye, ear, nose, and throat.

Several of them are of very special importance, relating, as they do, to rare conditions or to groups of cases seen only in large institutions in sufficient numbers to be of importance. From this point of view some of the articles should give more details and conclusions, since the advantages enjoyed by the writers would warrant them, but all are valuable contributions to the literature of the special subjects treated, in convenient form, very readable, and should not be absent from the library of the clinician in these branches at least.

L. A. P.

A TREATISE ON APPENDICITIS. By John B. Deaver, Surgeon to the German Hospital. Philadelphia: P. Blakiston, Son & Co., 1896.

Dr. Deaver is well known as one of those surgeons who, after a large experience with appendical inflammation, holds the most radical views as to its treatment, and is ever forward in defending them. This he does at considerable length in the profusely illustrated volume before us, which may be taken as Dr. Deaver's defence of his position. The anatomy of the appendix and the pathology, symptomatology, and treatment of inflammation of this much-discussed organ are taken up in detail, and

throughout all, to the end in view, is justification of the author's stand-point. The chapter on anatomy is clear, concise, and accurate, as might be expected from a teacher of Dr. Deaver's experience. The articles on symptomatology and differential diagnosis are good, the important points are well brought out; great stress is laid on what are styled the three cardinal symptoms,—pain, tenderness, and rigidity. From a pathological side the book is disappointing. There is a looseness in the use of terms in describing pathological specimens, and a lack of detail which robs the case histories of much of their value. It is to the practised pathologists rather than to the practical surgeon that we must look for advance in this direction. The treatment preferred can be summed up in one word, "operation," and that as soon as the diagnosis is made. To many surgeons of wide experience this view will appeal in vain for support, as will the author's concurrence with Ribbert's statement that but sixteen out of four hundred cases permanently recover under medical treatment, and the same, perhaps too conservative, gentlemen will question the wisdom of attempting to remove the appendix in every case of abscess. We have seen many cases of appendical abscess opened and drained where it did not seem wise to make an extensive separation of the tissues to hunt for the appendix, in which the recovery was satisfactory, and no recurrence of the disease has taken place in a number of years. In many of such cases the appendix has probably sloughed off or been obliterated. The discussion which the book has already aroused shows that some at least of these men are unconvinced, and that we have not yet reached the end of the argument. The book is illustrated with many rather highly-colored drawings of specimens, with notes of the corresponding cases, and a very good series of cuts showing the stages of the operation of removal of the appendix.

H. R. W.

A SYSTEM OF MEDICINE. By many writers. Edited by Thomas Clifford Allbutt, M.D., Regius Professor of Physics in the University of Cambridge, etc. In five volumes. Price per volume, cloth, \$5.00. New York and London: The Macmillan Company.

It is gratifying to the American reader to see that the first article in the elaborate system emanating from Great Britain is the work of one of our countrymen, Dr. John S. Billings. This system is the work of over fifty authors, comprising the most distinguished English writers, and, in addition, from the United States we find contributions from Dr. John K. Mitchell and Dr. M. Allen Starr.

Dr. Billings in less than twenty pages gives us a summary of medical statistics including both mortality and morbidity records. The latter are necessarily defective, except as relates to the army and navy, owing to the absence of any system of registration further than for a few of the infectious diseases. The morbidity of tuberculosis, important as it is, is thus an unknown quantity. Dr. Billings brings out in a very interesting way the wonderful differences between various nationalities in reference to the death-rate from phthisis. It would seem probable that the Jewish race possesses a distinctly higher degree of immunity against the bacillus of tuberculosis and the micrococcus of pneumonia when compared with other races. Taking the statistics of deaths for the six years ending May 31, 1890, for the Irish, the Germans, the Russian and Polish Jews, the American white offspring of American mothers, and the colored,—all in New York City,—it was found that the average annual death-rate from consumption per 100,000 of population was: For the Irish, 645.73; colored, 531.35; Germans, 328.80; for the American whites, 205.14; and for the Russian and Polish Jews, only 76.72. In the last-named race there was only one-half the mortality from pneumonia observed among the negroes and the Irish. Inquiries of this kind immediately give rise to questions which we have not here space to discuss, but in the solution of these problems we always have to fall back upon governmental aid.

Dr. John Beddoe, who writes the chapter on anthropology and medicine, calls to

his aid "the gigantic series of anthropological medical statistics which we owe to Dr. Baxter and to the American Civil War."

In discussing temperament, Dr. Rivers calls attention to the excellent work of Professor Kræpelin, of Heidelberg, who has been making an investigation of the fundamental properties of the mind, which are of great importance in the study of temperament.

Mr. Jonathan Hutchinson discusses briefly the laws of inheritance in disease, and the medical geography of Great Britain is concisely described by Haviland. The attempts to show the distribution of heart-disease, for example, are not productive of any special result, although two pages are used in the effort.

The chapter on inflammation, in ninety-five pages, is from the hand of Professor John George Adami, of Montreal. In the lists of authors we find in this instance a reversal of names. The author defines inflammation "as the series of changes constituting the local manifestation of the attempt at repair of actual or referred injury to a part, or briefly, as the local attempt at repair of actual or referred injury." A valuable classified bibliography accompanies this article.

In the chapter on the doctrine of fever Dr. J. Burdon Sanderson refers to some very interesting experiments by Maragliano, who, by the aid of Mosso's plethysmograph, demonstrated the changes of volume of the limbs in fever. It was first ascertained that in healthy persons, after a meal, the volume of the arm, as thus measured for a number of hours, slowly declines as the time which has elapsed since taking food increases, and that the rate of this decline is uniform.

In ague it was found that the accession of an attack is marked by a very obvious diminution of volume which is antecedent to the rigor; and that in the crisis likewise an increase of volume is always the harbinger of the critical thermolysis. As to the cerebral heat-centres, Professor H. C. Wood receives due credit for his discovery in 1880, that injury of a certain part of the cortical motor area which surrounds the crucial sulcus in the dog produces pyrexia. Dr. Wood also points out, as noted by Sir Joseph Fayrer, the veteran surgeon-general of India, that when death occurs suddenly during great exhaustion or muscular action with fatigue, it may be due to coagulation of the cardiac myosin, an event which is likely to occur during any great muscular exertion at a much lower temperature than usually determines it when there is no great muscular exertion. For example, men fighting in a very high temperature, or, for that matter, working hard in times of peace, may fall dead suddenly when exposed to the direct or indirect heat rays. Sir Joseph would, no doubt, be very much interested in the recent studies of Dr. Ira Van Gieson, of the New York State Pathological Institute, who has approached this subject from the stand-point of pathological chemistry.

The pathology of nutrition is treated by Dr. F. W. Mott, and contains the latest additions to our knowledge in this field. Messrs. Shattock and Ballance state in their article on the general pathology of new growths that they have tried the effects of subcutaneous injection of a fifty per cent. glycerin extract of carcinoma and sarcoma, hopeless cases being selected for treatment. The injections in one case of mammary carcinoma exceeded fifty in number, ten different carcinomata being employed. No local reaction ensued and the procedure in no case retarded the growth and multiplication of the tumors. Fresh sheep serum, which comes from an animal supposed to enjoy a natural immunity, also gave negative results. The authors refer to Coley's method of injecting the combined toxins of *Streptococcus erysipelatis* and *Bacillus prodigiosus*, but they do not seem to have used them. They caution operators to avoid using a knife for the division of healthy tissues after it has once been infected with the juice of the tumor, lest the seeds of recurrence be sown along the freshly-cut surfaces.

The article on the principles of drug therapeutics, by Dr. Daniel J. Leech, is quite largely historical and, so far, entertaining. The articles on climate and aëro-

therapeutics, by Herman Weber, Michael Foster, and C. Theodore Williams, are worthy of this distinguished trio. The American reader naturally looks to see what they have to say about the American resorts and climates, and it is gratifying to find our principal resorts truthfully characterized. Much of the reputation which our Colorado climate has acquired among our English *confrères* is due to the personal observation and writings of Dr. Charles Theodore Williams. His presidential address before the Royal Meteorological Society in 1893, on the high altitudes of Colorado and their climates, was an admirable and a valuable contribution to climatology. In one respect Drs. Foster and Weber fail to do us full justice. They place the range of temperature in the interior of continents at 100° F. In the State of Pennsylvania, however, there are localities where the range is over 120° F., and in Minnesota and the Dakotas it takes 140° F. to cover the extremes of temperature.

One of the devices for providing an artificial climate mentioned by Dr. Williams is the pneumatic cabinet, an American invention. This much-discussed apparatus has been used in the Brompton Hospital with some degree of success. A committee appointed to investigate its capabilities showed that it caused (1) increase of chest circumference, (2) increase of spirometric capacity, and (3) in many cases of consolidation, diminution in the area of dulness. The cabinet was found less successful as a vehicle for medicinal agents. Caution is necessary, as hemorrhages have followed its use and the temperature of some cases of pyrexia has been increased.

Mineral springs are described by Herman Weber, who gives due credit to our wealth of mineral waters.

In the article on electricity Dr. H. Lewis Jones discards the terms franklinism, galvanism, and faradism, speaking instead of "electrostatic methods, of treatment by the battery current, and of treatment by the induction coil current." The term "battery current" does not meet the requirements of the case, for even one or two cells may properly be designated by the term battery even when used to produce the induction current. The term multiple battery current would answer better, although that does not fully describe the current. Regarding the electrical methods of Apostoli, for the treatment of uterine fibroma, the author says they "have fallen into discredit in this country, but no doubt there is some value in his treatment. . . . It is quite possible that it may again be revived here." This has been a burning question among our gynecologists, and after a great deal of acrimonious discussion the subject has lapsed into a deserved desuetude.

The chapter on massage, by Dr. John K. Mitchell, is thorough and concise. Here again the work of Americans comes to the front, as evidenced by the adoption of the "rest cure" the world over.

Sir Dyce Duckworth treats in a clear and orderly style the subject of the general principles of dietetics in disease. Specific directions are furnished which cannot help being of value, coming from a man of such experience and good judgment as this well-known author. The same may be said of Eustace Smith's contribution on the diet and therapeutics of children.

Next follows a chapter on nursing, by Miss Amy Hughes, who has been asked to write in order that medical men may know what to expect of their nurses. This is a timely and succinct account of what we ought to expect, and shows that the author has high ideals of her duties, and her influence upon nurses in training must be of the very best. We should be very glad if reprints of this article could be placed in the hands of every nurse in training. Physicians are too lax in their requirements or too reluctant to speak the word of advice or correction when brought in contact with a tactless or careless nurse. As the writer says, "The gravest fault, short of negligence, is love of gossip, personal or professional. To talk to patients about their ailments and treatment, to describe other cases to them, to indulge them in medical histories, and to discuss the comparative merits of medical men work infinite harm, especially to those of nervous temperament, who are chiefly disposed

to seek such confidences." Miss Hughes fixes twenty-three to twenty-four as the earliest age at which a nurse should begin her training. One thing she says which we decidedly object to, at least for American patients and an impossibility in the American climate,—a temperature to be maintained at 50° to 60° F. for surgical wards. She allows 60° to 65° F. for the medical wards. In the United States, in the cooler season, we usually find it desirable to maintain our wards at from 68° to 70° F., but in the summer months even these are an impossibility. The author's reference to sal-alembroth will need an explanation for the benefit of American readers, as it is a term for the combination of corrosive sublimate with ammonium chloride.

The hygiene of youth and the subject of life assurance are briefly discussed. Eighty pages are devoted to the general pathology of infection by Dr. A. A. Kanthack, the lecturer on pathology at St. Bartholomew's Hospital. The subject is ably discussed. His conclusions as to the use of antitoxin in diphtheria are that its success is so undoubted as to silence all opposition. Dr. Herringham, in his article on the serum treatment of this disease, corroborates these conclusions. We cannot refrain in this connection from calling attention to the vigorous article by Baginsky, of Berlin, printed in the *Medical Record* of August 8, in this year, in which he handles without gloves one who has tried to throw discredit on the successes of the German hospitals in the use of this remedy. Kanthack believes that many failures in the treatment of diphtheria in this way have been due to inadequate dosage, while of course advocating the additional use of local antiseptics and tonics.

Puerperal septic disease is treated by Playfair, who gives sound advice as to the use of intra-uterine antiseptic irrigations. Medicinally he advises in the early stages twenty grains of antipyrin combined with thirty minims of sal volatile to counteract depression. He also advises quinine in twenty-grain doses night and morning.

Influenza is discussed by Goodhart, enteric fever in an elaborate manner by Julius Dreschfeld, and cholera by Macleod.

The system is the best exponent of British teaching and practice as it exists today. The contributors are men of ripe experience, and the editor has so well planned the work of the series of volumes that we shall look with great interest for their appearance. The presswork is excellent. We have failed to discover a single typographical error in the volume examined.

G. H.

A MANUAL OF THE PRACTICE OF MEDICINE. By George Roe Lockwood, M.D., Professor of Practice in the Women's Medical College of the New York Infirmary; Attending Physician to the Colored Hospital and to the City (late Charity) Hospital; Pathologist to the French Hospital; Member of the New York Academy of Medicine, of the Pathological Society, of the Clinical Society, etc. 12mo, pp. 935, with 75 illustrations in the text and 22 full-page colored plates. Cloth \$2.50. Philadelphia: W. B. Saunders, 1896.

In the preface of this book, which is one of Saunders's New Aid Series, the author hopes "that the work will meet the requirements of those who heretofore have been obliged to resort to the larger works of reference with which medical literature is so well supplied." Your reviewer considers this statement to indicate a misguided ambition. Why increase the number of works of this kind when there are so many at present extant? Such a volume is of greatest value to the student of medicine, and by him it will be almost invariably used to the disregard of the standard text-books and of the dependence upon personal notes taken at the lecture. It seems to your reviewer that it is a mistake to encourage the student to obtain his knowledge from a book which is avowedly a compilation rather than from the text-book itself. If it is to aid the student in connection with the text-book, we think it will be as often abused as are the translations of the Greek and Latin authors, the use of which has been prohibited in the academic departments of our universities.

If it is argued that there are many students who are unable to take notes at the lecture, we think that no willing pupil is so deficient in attention but that he could gather a few points, however fragmentary. The attention that will be given to the professor in order to record the essential facts will insure a better understanding of the subject than the reading of an incomplete discussion, such as will be found in the abridged volume under consideration.

Again, in using a book of this kind to the exclusion of the "larger works," the reader loses the individuality of the prominent authors of our time.

Finally, errors and omissions creep into all such works. The one under consideration is no exception to the rule. On page 19 the author says, "The disease [typhoid fever] is in no sense personally contagious, cases of typhoid being received into the general wards of hospitals without risk." In the same paragraph he says, "It is from the stools that the danger of infection arises. . . . If the stools are not disinfected the bacilli will live and thrive in them." It is just here that the danger of typhoid fever pertains when treated in a public ward. Page 103, the treatment of diphtheria by antitoxin is dismissed with a few words, and nothing is mentioned regarding immunizing injections of serum in the human subject. Page 170 says, "The bacilli of tetanus are found in the wound secretions, in the nerves leading from the point of infection, and in the spinal cord of the patient." We believe Kitasato's investigations show that, next to the wound, the most frequent seat of the development of the tetanus bacillus is in the heart's blood and cerebro-spinal fluid. Under the treatment of actinomycosis, page 180, nothing is said about the influence of potassium iodide. Page 282, a dissecting aneurism is classed as a false aneurism. Under appendicitis nothing is mentioned about the rôle of the colon bacillus in the etiology of the disease, page 506. Page 509 says, "Bacterial examination usually reveals pure cultures of the *Bacillus coli communis*." That is in the pus of appendiceal abscesses. Page 514, under the treatment of appendicitis we read: "Opium is to be given, to quiet the patient and to allay pain, but large doses to the point of semi-narcotization are not to be recommended. Cathartics are absolutely contraindicated, because of the danger of rupturing limiting peritoneal adhesions by the increase of intestinal peristalsis." We would prefer to use cathartics in preference to opium, according to the advice and example of Deaver. J. M. S.

BORDERLAND STUDIES. MISCELLANEOUS ADDRESSES AND ESSAYS PERTAINING TO MEDICINE AND THE MEDICAL PROFESSION, AND THEIR RELATIONS TO GENERAL SCIENCE AND THOUGHT. By George M. Gould, A.M., M.D., formerly editor of the Medical News. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street, 1896.

We confess to the old-time love for a good essay, and believe nothing does more for a man intellectually than the reading of a live, intelligent, breezy exposition, even of views antagonistic to his own. There is something in the style of the true essayist that makes his thought luminous through dull type and paper till it warms and lights the very soul; a style inimitable; unattainable by the great host of ready writers of the day, who can do a poem or a story on demand, but fail utterly in the task which was a bagatelle to Thackeray, a pastime to Lamb. America has produced few essayists in the highest, truest sense. The ideal of this style, the intangible charm of the true essay must be sought far back of Lamb, Christopher North, and Addison, even as far as Horace, where, curiously enough, it can be found and studied in the work of the master, in the satires and the *ars poetica*, which, stripped of their rhythm and turned into good honest English prose, we recognize as the fathers of all the essays that we love, of all the gentle satire and worldly wisdom of "Philip" and the "Newcomes," and "The Book of Snobs," the charm of Holmes, and of those perfect disquisitions on life and manners with which the "Easy Chair" of Harpers' for so many years delighted the cultivated American world.

It is not material and valuable fact alone, but fact as a bright man looks at it, speculates and theorizes about it, the emotions it stirs within him, and the queries it suggests, that makes the essay. It is a ramble on some rugged sea-side or blooming heath with a bright and spirited guide rather than a solemn measurement of heights and depths or a dissertation on flora or geology.

All this Dr. Gould's book suggests. Read his "Modern Frankenstein," "Character," "Immortality," and the spirit of the writer will seize on and sweep away with it the most reluctant reader, where it will, like the wind that bloweth, and, after a rush and scramble, or a soaring where only the eagle goes, after many a tussle with great thoughts and mighty winds of doctrine which buffet them both, it will set him down breathless but delighted, with locks disarranged and streaming, with neck-tie awry and hat tilted, but all the better and fresher and brighter for many a day to come.

Some of these essays were written in editorial routine, some as addresses before medical societies and reunions, but through them all runs the same spirit of earnestness, of reverent irreverence, of devout scepticism, and through all and over all the love of the lover of Truth, who would throw to the winds the idle trappings in which the world has disguised his beloved and tried so long to veil from him the glory of the beautiful soul within.

Love of nature that lives and a half-concealed scorn of the inanimate shows in every page. Read "Vivisection" and "The Rôle of the Maternal Instinct in Organic Evolution," and believe, if you can, that the writer could be regardless of animal suffering and careless of experimentally inflicted woes. "Life and its Physical Basis" exhibits well the theory that Dr. Gould has so beautifully worked out to a more perfect conclusion in his "Method and Meaning of Life." Both are based upon the evidences of effort and struggle, kindness and love on the part of Life, the Unknown, in its endeavor to subjugate matter; the author tracing with almost pathetic interest the long, untiring struggle of some power beyond our ken to overcome unyielding substance, to work through the evolutionary process and painfully, step by step, till earth's deserts blossom as the rose. The whole essay is one sustained and successful effort to "look through nature up to nature's God," a study far removed from the materialism of science, but faintly allied with pantheism, and which sheds a light of hope in the dark regions of materialism. To the rigidly orthodox heart it may be gall and bitterness, but to the growing multitudes that float on a sea of religious uncertainty, "driven and tossed," it may well bring comfort, reverence, and a sort of faith by no means to be despised.

Much of the book is taken up in discussing the varied aspects of scientific and popular medicine as they strike the writer. "Is Medicine a Science?" "The Duty of the Community to Medicine," "Charity Organization and Medicine," "Hospitalism," and "The Etiology, Diagnosis, and Treatment of the Prevalent Epidemic of Quackery," with their scorching irony; "The Untrustworthiness of the Lay Press in Medical Matters," "The Disorganization of Medicine," and "Concerning Specialism," these all strike right and left, giving good blows, rough and honest, and yet never strike too hard or hit other than him who richly deserves it.

In "Dreams, Sleep, Consciousness," the author finds himself near his own beloved fields, and fills his pages with wisdom and fancy, experience and imagination. "Dreams," he says, "argue against our innate depravity. Unless feelings of profound pity, contempt, indignation are aroused, I find that in dreamland I am not immoral but unmoral." Dr. Gould drops a hint as to the visual foundations of dreams which we hope some one will some day pursue much further than has yet been done,—studying the dreams of the congenitally blind.

"Immortality" voices the clamor of the newly-awakened world of science against old, mechanic theology. The dearest tenets of the ages will not bear rude confrontation with the new science of the day, and men go through years of life, as

Drummond says he did, keeping as widely apart as possible, in their big or little minds, the rival thoughts and beliefs that are aching for a fight for supremacy; while the soul each day roams farther afield and meets on the borderland strange, new friends which perplex it, as they demand an entrance which it dare not refuse, yet fears to grant; and all the time the household gods, the old Teraphim, sit shuddering, deep in the silent gloom within.

Dr. Gould's pages are filled with bright thoughts and deep-searching queries. What is it in ourselves, he asks, that we would choose to be immortal? What is it that can reasonably be expected to survive death? "The one fundamental mystery of the explainable world is why life seeks objectification in material forms, and why it seeks it with such vehemence and ardor." "Why or how or whence life comes to us, we do not know now, but the transcendent miracle is ever before our eyes; infinitely rich and free, life is filling, thrilling, surcharging every molecule of matter to which, with wondrous power and ingenuity, it can gain access." "This extension of the law of the conservation of force to things biologic and psychic is a two-edged sword; it offers conclusive evidence of the fallacy of the materialist and the believer. There is no annihilation. Your life at death not only may not stop but cannot stop." "You can't love God unless you love and know what he is doing in this universe."

At least we can say that Dr. Gould gives us one aspect of religion, or a true religion of one aspect, and of the intense religious feeling with which he interweaves biologic, and, in fact, all science, with his own chosen theory of life the reader soon becomes aware, and while he may dissent from his views he must confess this belief of the author's to be a vast step forward and upward from the depths of scientific materialism or pure negative agnosticism. As a view of a religion, reverent, helpful, and cheering, which can be extracted from modern science and exploited by a scientific man, this volume, in many of its essays, like Dr. Gould's more thorough and finished work, "The Method and Meaning of Life," is throughout a beautiful and valuable example. To the Greeks it may be foolishness, but to the student of life who finds the old paths blocked and overgrown, it brings an insight surely of the power and love of a God not all "unknowable."

EDWARD W. WATSON.

A MANUAL OF ANATOMY. By Irving S. Haynes, Ph.B., M.D., Adjunct Professor and Demonstrator of Anatomy in the Medical Department of the New York University; Visiting Surgeon to the Harlem Hospital; Member of the Society of the Alumni of Bellevue Hospital, of the American Association of Anatomists, etc. 12mo, pp. 680, with 134 half-tone illustrations and 42 diagrams. Cloth, \$2.50. Philadelphia: W. B. Saunders, 1896.

This is another of Saunders's New Aid Series. While your reviewer has formerly expressed himself in regard to the multiplication of works of this class, and while not having changed his opinion in this respect, still he must admit that this book is entitled to some praise. So far as the reviewer's knowledge goes, it is the first manual to bring the consideration of the important visceral and nervous anatomy up to date, and also the first to treat of these subjects from the rational stand-point of embryology. Contrary to the usual custom, this volume contains much original work which has been done by the author with the aid of the camera.

Inaccuracies have occurred, however. For example, page 158, we read, "After entering the skull through the foramen lacerum medium," in reference to the internal carotid artery, should read, "through the carotid canal." Page 160, the posterior communicating arteries are said to connect the posterior and middle cerebral vessels, while they really unite the posterior cerebral and internal carotid arteries. Page 166, we read, "While there is some ratio between the degree of intelligence and the brain-weight, it is at the most very unreliable for comparison between indi-

viduals of the same race." Dejerine¹ states that "although the volume of the encephalon is in a constant relation with the capacity of the cranium, it in no way follows that the intellectual capacity is proportional to the mass and to the volume of the encephalon." Page 204 does not give sufficient clearness to the deep origins of the auditory, glosso-pharyngeal, pneumogastric, and spinal accessory nerves. The boundaries of the axilla are omitted in the text, and are afterwards inserted in an addendum; but no reference to this omission is made in the body of the work. These examples will show that absolute dependence should not be placed on a work of this kind, although it might be a valuable guide. The illustrations are excellent, and the index good.

J. M. S.

ELECTRICITY IN ELECTRO-THERAPEUTICS. By Edwin J. Houston, Ph.D., and A. E. Kennelly, Sc.D. Elementary Electro-Mechanical Series. Pp. 402. New York: The W. J. Johnston Company, 1896.

As stated in the preface, this little book is intended to meet a growing demand, both on the part of the medical practitioner and the general public, for reliable information respecting such matters in the physics of electricity applied to therapeutics as can be readily understood by those not specially trained in electro-technics.

The book certainly accomplishes the object intended. The language is very free from confusing technical expressions. The descriptions of apparatus are exceedingly clear. The authors do not enter at all upon a discussion of the therapeutic uses of electricity. The different forms of apparatus used in medical electricity are described, and the principles upon which they work explained. The chapters on Electro-motor Force, Electric Resistance, and upon Electric Work and Activity are especially good. The book ends with a chapter on "Dangers in the Therapeutic Use of Electricity."

J. P. A.

PRACTICAL POINTS IN NURSING, FOR NURSES IN PRIVATE PRACTICE. With an Appendix containing Rules for Feeding the Sick, Recipes for Invalid Foods and Beverages, Weights and Measures, Dose List, and a Full Glossary of Medical Terms and Nursing Treatment. By Emily A. M. Stoney, Graduate of the Training School for Nurses, Lawrence, Massachusetts; Superintendent of Training School for Nurses, Carney Hospital, South Boston, Massachusetts. Pp. 456, illustrated with 73 engravings in the text, and 9 colored and half-tone plates. 12mo, cloth \$1.75. Philadelphia: W. B. Saunders, 1896.

This book is designed "to explain, in popular language and in the shortest possible form, the entire range of private nursing as distinguished from hospital nursing," and yet on pages 23 and 24 over thirty lines are devoted to "Hospital Etiquette." It is also designed "to instruct the nurse how best to meet various emergencies, . . . studiously refraining, however, from advising the nurse to act upon her own responsibility, or to assume personal treatment of the patient except under circumstances of great urgency;" and on page 25 we find a list of four active remedies which the nurse is told she should carry in her bag, and which, in our opinion, she should never use upon her own responsibility. These are digitalis, strychnine, morphine, and ergot. It seems to your reviewer that there is a field for a book on nursing which would attempt just enough, and not too much. We consider that too much has been attempted here. If the author had confined herself to describing the methods of administering remedies and of carrying out treatment, without having added a consideration of the different diseases and their treatment, many mistakes and omissions would have been avoided. Take the subject of typhoid fever, for example: on page 83, eleven lines are devoted to the method of adminis-

¹ Anatomie des Centres nerveux, Paris, 1895, p. 236.

tering a cold tub-bath. Under the heading of typhoid fever nothing is mentioned about the use of cold tubbing in this disease, and on page 219 we read that "tepid baths are given to lower the body temperature." In the days of portable bath-tubs and their recognized value the nurses of the older, as well as of the younger, classes should be familiar with their use. Page 218: "The milk diet" (in typhoid fever) "should be alternated with beef-tea, chicken-broth, oyster-broth, coffee, or cocoa." Other instances could be cited, such as the advice as to the use of morphine in appendicitis, page 248. In the glossary we find some curious definitions, such as: "Aortic valve,—The upper valve on the right side of the heart." "Apoplexy,—Sudden insensibility from pressure on the brain." "Auscultation,—Listening to sounds of the body for the purpose of diagnosis. . . . The sounds heard are called ronchi. . . . A nurse should learn to use the stethoscope by personal application." "Biparous,—Bearing twins." "Chronic,—A lengthy, mild disease." "Pneumogastric,—Relating to the lungs and stomach, and applied to certain nerves, etc., connecting those two parts." "Pupil,—The iris or centre of the eye." "Spinal cord,—The marrow of the spine." There are many other points which could be improved upon.

J. M. S.

A TEXT-BOOK OF PRACTICAL MEDICINE. By Alfred L. Loomis, M.D., LL.D., Professor of Pathology and Practical Medicine in the Medical Department of the University of the City of New York; Visiting Physician to Bellevue Hospital, etc. Revised and enlarged, with two hundred and seven illustrations and one chromo-lithographic plate. Eleventh edition. 1134 pages. Price, cloth, \$6.00; leather, \$7.00.

Dr. Loomis was engaged in a revision of the present edition of his work at the time of his last illness. After his death only such alterations or additions as were thought absolutely necessary were made. Drs. Coakley and Fisher revised the sections on Diseases of the Nose and Throat and Nervous Diseases respectively; while Dr. Coleman assisted in the general revision. Dr. Loomis was so well known in America as a distinguished and impressive teacher, and his work has passed through so many editions, that little need be said in comment of it. The author is justly known as one of the clearest and most vigorous of American teachers, and his book has been a representative standard text-book. As far as the present edition is concerned, every effort has apparently been made to bring it up to date, and, as far as this is possible, has been accomplished. There will always remain, of course, certain matters of newer knowledge which cannot readily be included in a revised edition. To this extent alone the present edition seems deficient.

A. S.

THE STUDENT'S MEDICAL DICTIONARY. Including all the Words and Phrases generally used in Medicine, with their Proper Pronunciation and Definitions, based on Recent Medical Literature. By George M. Gould, A.M., M.D., with Elaborate Tables of the Bacilli, Micrococci, Leucomains, Ptomaines, etc.; of the Arteries, Ganglia, Muscles, and Nerves; of Weights and Measures; Analyses of the Waters of the Mineral Springs of the United States, etc. Tenth Edition, Rewritten and Enlarged. Price \$3.25 in cloth. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street, 1896.

It is with great pleasure that we recommend the "Student's Medical Dictionary" to our readers. It is a work of true merit: up to date, carefully edited, well printed, and moderate in price.

Page 191 of the old edition, issued first in 1890, was opened at random, in order that the new additions might be noted. The word "hidrosis" (*ιδρωσ*) is there defined as "the formation and excretion of sweat." In the present edition, page 312, the pronunciation is given, the proper accent is added to the Greek word, and two extra

uses of the word are defined,—namely, abnormally profuse sweating, and any skin-disease marked by disorder of the sweat-glands. From hidrosis down to histogenesis, at the bottom of the column, in the old work, there are fifteen words; in the new there are twenty-three words.

It seems but yesterday that Röntgen made the important announcement of his new discovery, and yet we find the words skiagraphy, skiography, skotography, radiography, electrography, electroskiography, and Röntography, defined and arranged alphabetically in their proper places.

There is but little use for the valuable, but not revised, appendix, by Dr. Daland, giving a description of the mineral springs of the United States. The ordinary medical student certainly does not want to refer to this article, and the material should be placed, if it must be put in a dictionary, in the larger illustrated work by the same author.

Even the few peculiarities of spelling appear lost in the excellence of the whole, and the reviewer does not feel called upon to criticise some minor errors and inconsistencies where there is so much merit,—almost amounting, in places, to perfection.

H. W. C.

PRACTICAL URANALYSIS AND URINARY DIAGNOSIS. A Manual for the Use of Physicians, Surgeons, and Students. By Charles W. Purdy, M.D., Queen's University. Second, Revised, Edition. With numerous illustrations, including photo-engravings and colored plates. In one crown octavo volume, 360 pages, in extra cloth, \$2.50 net. Philadelphia: The F. A. Davis Company.

This manual is an excellent working book for the laboratory of the practising physician. The first edition has already been favorably reviewed in the July, 1895, number of the *INTERNATIONAL MEDICAL MAGAZINE*, and the appearance of the second edition so soon after the first speaks well for the popularity with which the work has been received. There are, therefore, but slight changes made in the reading matter, the number of pages remaining the same. There are errors and inaccuracies,—too many, in fact, for a second edition. Dr. Patrick Manson would certainly not be pleased to find his name spelled Mason, on page 209; von Jaksch's name is written Jaksch, Von Jaksch, and v. Jaksch. Why should the statement be made that "acetonuria" is frequently associated with certain forms of *cancer*, notably *carcinoma*?

We feel sometimes as if we wished that the supply of the *Annual of the Universal Medical Sciences* paper, used in binding and ornamenting the front and back pages of the F. A. Davis books, would give out, for while the color varies the design does not change.

H. W. C.

ITEMS OF INTEREST.

DURING the summer the commissioners of Bellevue Hospital, New York, granted one Dr. O. permission to experiment upon certain patients in the alcoholic wards of that institution. Dr. O. claimed to have possession of a remedy that would cure alcoholism. After the permit had been granted, the visiting physician, then on duty, remonstrated with the commissioners for granting an outside physician this privilege, and requested that the "cure" be tested under the supervision of the regular medical staff.

The Use of Hospital Wards for the Experimentation with Secret Nostrums.

As a necessary consideration for the continuance of treatment the attending physician demanded the composition of the "cure." When Dr. O. was asked to publish the formula of his remedy he absolutely refused; whereupon, in order to avoid friction, the commissioners set aside a special ward in which the experiment might continue under the supervision of Dr. O. The cases previously treated in the general ward were accordingly transferred to the special ward. Later the commissioners were advised of the death of two of the patients who had been sent to the special ward to be cured. Thinking they had made a mistake in allowing the experiment to proceed, the commissioners then addressed the medical board and requested them to investigate the method of conducting the therapeutic test. To this request the medical board made a dignified reply, of which the following is a part: "In regard to the specific matter referred to in your communication, while we are always ready to investigate any scientific problem presented to us, we are unable to find any logical basis for the investigation of the action of any remedy or remedies, or the efficacy of any method of treatment which does not involve a full knowledge of the composition of the remedy, together with accurate and full details of the proposed plan of treatment; we consequently have and can have no report to make of the scientific cases referred to in your communication.

"In view of our long public service in your hospital, we feel justified in deprecating the trial in the hospital of any secret remedy or plan of treatment, as opposed to the universally recognized traditions of our profession, and to the best interests of the public and the sick poor under our care."

The remedy in question has been conclusively shown to be managed by an incorporated company, all the stock of which has been paid in; in fact, it is a secret nostrum in every sense of the word. It would seem, therefore, that the commissioners, instead of fostering a remedy which would prove

to be a blessing to humanity, have, in truth, been lending the wards of a charitable institution as an advertising medium. The experiment seems, however, to have died a natural death.

In this same line it is interesting to recall the fate of Dr. B.'s "consumption-cure" experiments, which were conducted at St. Agnes's Hospital, Philadelphia, in the early part of the present year. In this instance, when failure of the "cure" had been demonstrated, the physician who had been conducting the experiment made accusations of broken faith on the part of the attending physician who had extended him the courtesy of his wards and his patients. These accusations appeared in the public press and unjustly involved the integrity of both visiting and resident physicians.—*Medical News*, August 1 and 22, 1896.

At the annual meeting of the British Medical Association, which was held at Carlisle on July 28, 29, 30, and 31, there was an attendance of over seven hundred members. Among the new measures discussed at this meeting the most important to the profession was the scheme of medical defence. This resolution seeks to appoint a central committee which shall protect the members of the regular profession in Great Britain from attack and from the operations of irregular practitioners and of quacks. It is also proposed to appoint a committee of eleven members which shall hold monthly meetings for the conduct of the journal and the finances of the association, and which shall have the management of special questions,—such as parliamentary bills, ethics, medical charities, and the like. It is proposed to compensate the members of this committee for their services. A special committee bore to the association an urgent invitation from the Montreal, Canada, branch to convene at that city in 1897. The council of the association accepted the invitation, which was subsequently confirmed by the general meeting.—*British Medical Journal*, August 8, 1896.

Drs. Liston and F. B. Nolan, of Balbriggan, near Dublin, recently brought before the recorder of Dublin a claim for £6 each for medical attendance upon a poor man who was accidentally killed.

An Angry Judge. The widow got £400 damages, but she refused to pay the men who had done their best to save her husband.

They had to treat fractured limbs, a lacerated lung, a ruptured liver, and a ruptured bladder, and see the patient twice in the middle of the night. Dr. Liston paid in all twenty-eight visits. The charges were ridiculously low. Even the recorder thought it would be monstrous if professional men who were suddenly called to attend a case of this kind were to be met with a denial of all responsibility for fees. The appearance of the weeping

defendant in the box, however, and the statement that £3 had been offered and refused, drew from the recorder a reference to 1s. 3d. fees in England and a bit of experience. Here it is: He himself broke his leg in Yorkshire and was attended by one of the first men in his profession during his entire illness, and what did they think he was charged?—£9 18s. We trust this was during the period of the judge's struggle as a young barrister. If it occurred since he has been enjoying a large salary as a judge, we think he would have shown more discretion by keeping the tale to himself. We hope one of the first men in his profession now appreciates the conduct of an Irish judge who makes use of his medical attendant's moderation to grind down the claims of other doctors. In the end a decree was given for £3, and then Dr. Liston, addressing his solicitor, said, "Mr. Walsh, appeal, appeal:" whereupon the judge is reported to have had Dr. Liston removed from the court, winding up as he left the bench by the exclamation: Six guineas each, indeed, for two doctors that settled this poor man in four days. But we may ask by what right Recorder F—— dares to make a charge that these "two doctors settled this poor man in four days." It is outrageous that any official paid by the state to administer justice should forget his position and insult gentlemen as learned as he, and whose profession is as noble. There is too much of this in some quarters.—*British Medical Journal*, July 18, 1896.

In the temple of the Goddess of Mercy, in the suburbs of Foochow, China, the visitor may see votive tags suspended. When asked the meaning of these offerings the abbess informed the inquirer that the bags contained the names of children who, on being attacked with small-pox, were brought to the temple and offered at the altar of the goddess, after which ceremony, which is supposed to save their lives, they were taken away. The bags containing the names of the children are left in the temple permanently.

In the August number of the *Review of Reviews*, Mr. W. T. Stead gives a synopsis of the life of Dr. Thomas John Barnardo and his thirty years' work among the destitute children of Great Britain. The sketch is exceedingly interesting and shows how, from a small beginning, a member of the medical brotherhood, for Dr. Barnardo is a Fellow of the Royal College of Surgeons, has been able to reclaim an average of one thousand children yearly from vice and degradation. The article describes Dr. Barnardo as "surgeon, editor, preacher, teacher, Jack-of-all-trades, and a past-master in all." Under the personal management of this one man we find eighty-five homes, offices, and charities in different parts of the kingdom into which the destitute are freely received, and in which children are brought up to be useful

A Chinese Treatment for Small-Pox.

The Father of Nobody's Children.

members of the community, when finally they are launched into the work-a-day world upon their own responsibilities. The practical result obtained is that these children, of both sexes, become useful and industrious citizens. During 1895 six thousand nine hundred and eleven children were maintained and educated by this system.

Annual Increase
of the Insane in
Pennsylvania.

The following table shows the annual increase of insane patients in all institutions in Pennsylvania, including State and private hospitals, almshouses, and jails, for the past twelve years:

1884.....	5374	—an increase of 36 over the previous year.
1885.....	5640	—an increase of 266 over the previous year.
1886.....	5923	—an increase of 283 over the previous year.
1887.....	6259	—an increase of 336 over the previous year.
1888.....	6510	—an increase of 251 over the previous year.
1889.....	6884	—an increase of 374 over the previous year.
1890.....	7399	—an increase of 515 over the previous year.
1891.....	7649	—an increase of 250 over the previous year.
1892.....	7855	—an increase of 206 over the previous year.
1893.....	8104	—an increase of 249 over the previous year.
1894.....	8616	—an increase of 512 over the previous year.
1895.....	8925	—an increase of 309 over the previous year.

The sum of these annual increases is 3587, or an annual average increase of 299 insane patients.

Buda-Pesth is at present engaged in the celebration of the one thousandth anniversary of the foundation of the Hungarian nation. Among the exhibits at this millennial celebration, which will prove attractive to visiting physicians and scientists, are the hygienic, the children's hygienic and educational, and the balneological. The exhibition of mineral waters shows a very ingenious departure from the routine method of displaying labelled bottles and analyses of their contained mineral waters. A series of panoramic views have been so arranged that the visitor may see the spring from which the water is derived, or the water "cure" establishment which is situated near the spring. Models of sewers, of the gas-works, of the water-works, of the public buildings, and of the hospitals illustrate the municipal departments of Buda-Pesth. A number of congresses convene in the Hungarian capital during the progress of the celebration, among which are the National Hungarian Congress of Hygiene and Medicine, and the Congress on the Housing of the Poor. As yet, in Buda-Pesth, the accommodation available for the working classes is inferior to that existing in the majority of large towns. The underground electric railway, the central milk-house, the town

slaughter-house, the pig-market of Steinbrück, the new water-works, and the system for the prevention of contagious diseases are worth the scientist's time, attention, and study. The Hungarians are said to be exceedingly hospitable to their foreign visitors.—*Lancet*, August 22, 1896.

The contributions for the erection of the memorial to Dr. William Meyer, the discoverer of an efficient method of curing adenoid vegetations of the pharynx, have reached five thousand dollars. This is all that will be required for the completion of the monument, which is to be designed by a Danish sculptor.

William Meyer
Memorial.

The Third International Congress of Psychology marks another step in the progress of one of the great sciences which minister to the art of medicine. The first congress was held in Paris in 1889, the second in London in 1892, and the third at Munich, from August 4 to 7, 1896, in the university. The organization of the congress was perfect, and the success of the meetings was due to the thought and labor of the gentlemen who, as representatives of the Science of Munich, had charge of the arrangements. The civilized nations of the world were represented by some of their ablest men, and the papers were of unusual interest.

The congress was opened by the address of Professor Stumpf, of Berlin, as president. Then followed the greetings from the state of Bavaria, the city of Munich, and the university. The principal papers were given in three general sittings, and among them were papers on "Pain," by Richet, of Paris; "Emotions," by Sergi, of Rome; "Psychology of Children," by Preyer, formerly of Berlin; "The Unconscious in Psychology," by Lipps, of Munich. Also papers from Exner, of Vienna; Sedgwick, of Cambridge; Ebbinghouse, of Breslau; Janet, of Salpêtrière. The special papers were given in the sections, of which there were five: I., Psycho-Physiology; II., Psychology of the Normal Individual; III., Psycho-Pathology; IV., Comparative Psychology (of Child and Animal); V., Psychology and Teaching.

The men who presented special papers were representatives of the best work done in Europe and America in the fields of philosophy, psychology, physiology, and psycho-pathology, and from the prominence of the men from the medical schools, especially of Paris, Vienna, and Munich, the congress might almost be claimed as an extra session of the great medical congress series.

While the papers were the important factors of the congress, there were other things which were very valuable in making the congress a complete

success. The hearty welcome extended by the city of Munich and the entertainments all added the element of human friendliness which bound the members into a body whose object was the bettering of a great science, that of the human mind. The next congress will be held at Paris in 1900.

W. S. W.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for accepted articles after publication; or reprints, if stated on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 716 Filbert Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

OCTOBER, 1896.

[No. 9.]

ORIGINAL COMMUNICATIONS.

SURGERY BEFORE THE DAYS OF ANÆSTHESIA.¹

BY JOHN ASHHURST, JR., M.D., LL.D.,

Barton Professor of Surgery in the University of Pennsylvania; Surgeon to the Pennsylvania Hospital, etc.

MR. PRESIDENT AND GENTLEMEN OF THE BOARD OF TRUSTEES AND HOSPITAL STAFF, LADIES AND GENTLEMEN:—A study of the condition of operative surgery before the days of anæsthesia reveals, on the one hand, a picture of heroic boldness and masterly self-control on the part of the surgeon, and, on the other, a ghastly panorama, sometimes of stoic fortitude and endurance, sometimes of abject terror and humiliation, but always of agonizing wretchedness and pain on the part of the unhappy victim, man or woman, whose necessities required a recourse to the surgeon's aid. And from our vantage-ground of a half century's experience it is difficult for us to understand why, with the constant and persistent efforts made by surgeons in past ages to lessen the pain of operations, and the gradual but continuous accumulation of facts showing that by certain agents pain could be temporarily abolished without danger, the eyes of all—patients as well as practitioners—yet seemed to be holden, and why, science and art working with a common object if independently, though the whole world seemed to be trembling on the verge of the discovery, it yet was not until fifty years ago to-day that the crucial experiment was made in this hospital, and that surgical anæsthesia became a glorious reality.

It is somewhat difficult to obtain an accurate picture of preanæsthetic

¹ An address delivered at the Massachusetts General Hospital on October 16, 1896, being the fiftieth anniversary of the first public demonstration of Surgical Anæsthesia.

surgery from the patient's point of view, probably for a similar reason to that indicated by the lion in the fable, when he criticised the artist for always representing a combat between lions and man as terminating in a human victory,—lions do not paint; and so as operations are habitually reported by surgeons and not by patients, we read of the skill and intrepidity of the operator, of difficulties met and overcome, and of victories snatched, as it were, from the very jaws of impending defeat; but we hear little of the tortures of the victim under the life-saving process, or, in an unsuccessful case, of the gradual subsidence of agonizing cries hushed in the silence of death. And yet we sometimes catch incidentally a side glimpse of an operation from the patient's stand-point, and can thus form some faint notion of the shades as well as of the high lights of capital surgery in days gone by. Those who are familiar with the history of British surgery seventy years ago will recall the famous case of "*Cooper vs. Wakley*," in which the enterprising founder and proprietor of the *Lancet* was sued and mulcted, though in but nominal damages, for the report of an operation for lithotomy performed by Sir Astley Cooper's nephew, Mr. Bransby B. Cooper. The report opens with a quotation from John Bell, referring to "long and murderous operations, where the surgeon labors for an hour in extracting the stone, to the inevitable destruction of the patient," and then having described in terms as graphic as uncomplimentary the operator's prolonged efforts to remove the calculus, and the words which showed his own anxiety and discomposure during the process, adds, "Such were the hurried exclamations of the operator. Every now and then there was a cry of Hush! which was succeeded by the stillness of death, broken only by the horrible squash, squash of the forceps in the perineum. 'Oh, let it go, —pray let it keep in! was the constant cry of the poor man.'" The patient was on the table nearly an hour, and after a night and a day of great pain "death," adds the reporter, "ended the poor fellow's sufferings, about twenty-nine hours after the operation." The fatal result appeared to have been due to peritonitis. It is, indeed, not an unheard-of thing that a surgeon's presence of mind should fail him in a difficult operation even at the present day; but at least the patient, unconscious through the blessing of anæsthesia, does not know it, and this complication is spared, to the great comfort of all concerned.

The "pitilessness" which Celsus urged as an essential trait in the operative surgeon—though Percy and Laurent declare that this pitilessness was meant to be apparent only—was indeed, before the days of anæsthesia, a feature in the surgeon's character which impressed very strongly the public generally as well as those immediately connected with the operation; and it may be feared that there are not wanting, even at this nineteenth century's end, some who would echo the comment of the younger Pliny upon the operative surgeons of his time: "They make experiments through deaths, and no head is secure from them."

It is interesting to recall that Sir James Simpson, of Edinburgh, shortly

after beginning his professional studies, was so affected by "seeing the terrible agony of a poor Highland woman under amputation of the breast that he resolved to abandon a medical career and seek other occupation; happily his intention was reconsidered, and he returned to his studies, asking himself, "Can anything be done to make operations less painful?" and, as every one knows, in less than twenty years became himself a high-priest of anæsthesia, and the introducer into surgical and obstetrical practice of ether's great rival, chloroform.

Not only did delicate women and tender children dread the ordeal of the surgeon's knife, but strong and brave men also recoiled from its use in horror. Buffon preferred death to relief from the agonies of calculus by the operation of lithotomy, and case after case is narrated by Monfalcon and other writers, in which men submitted themselves with the utmost calmness and fortitude to the hands of skilful operators, instantly falling into collapse after the first incision and without undue loss of blood quickly succumbing to the depressing effects of simple shock and pain.

No braver or more gallant gentleman ever lived than Admiral Viscount Nelson, and after his right elbow had been shattered by a French bullet in the assault at Teneriffe, he manifested the utmost courage, refusing to be taken to the nearest ship lest the sight of his injury should alarm the wife of a fellow-officer whose own fate was uncertain, and, when his own ship was reached, climbing up its side without assistance, and saying, "Tell the surgeon to make haste and get his instruments. I know I must lose my right arm, so the sooner it is off the better." "He underwent the amputation," we learn from a private letter of one of his midshipmen, "with the same firmness and courage that have always marked his character," and yet so painfully was he affected by the *coldness* of the operator's knife that, though when next going into action at the famous battle of the Nile, he could, after calmly finishing his meal, say to his officers, "By this time to-morrow I shall have gained a peerage or Westminster Abbey," yet he gave standing orders to his surgeon that *hot water* should always be kept in readiness during an engagement, so that if another operation should be required he might at least have the poor comfort of being cut with *warm* instruments.

But the most striking picture of which I am cognizant, showing the way in which an intelligent patient looked upon a surgical operation, is to be found in a letter written to Sir James Simpson by a friend, himself a member of the medical profession, who had had the misfortune to lose a limb by amputation before the introduction of anæsthetics: "I at once agreed," he says, "to submit to the operation, but asked a week to prepare for it, not with the slightest expectation that the disease would take a favorable turn in the interval, or that the anticipated horrors of the operation would become less appalling by reflection upon them, but simply because it was so probable that the operation would be followed by a fatal issue, that I wished to prepare for death and what lies beyond it, whilst

my faculties were clear and my emotions were comparatively undisturbed. . . . The week, so slow, and yet so swift in its passage, at length came to an end, and the morning of the operation arrived. . . . The operation was a more tedious one than some which involve much greater mutilation. It necessitated cruel cutting through inflamed and morbidly sensitive parts, and could not be despatched by a few strokes of the knife. . . . Of the agony it occasioned I will say nothing. Suffering so great as I underwent cannot be expressed in words, and thus, fortunately, cannot be recalled. The particular pangs are now forgotten; but the black whirlwind of emotion, the horror of great darkness, and the sense of desertion by God and man, bordering close upon despair, which swept through my mind and overwhelmed my heart, I can never forget, however gladly I would do so. Only the wish to save others some of my sufferings, makes me deliberately recall and confess the anguish and humiliation of such a personal experience; nor can I find language more sober or familiar than that I have used to express feelings which, happily for us all, are too rare as matters of general experience to have been shaped into household words. . . . During the operation, in spite of the pain it occasioned, my senses were preternaturally acute, as I have been told they generally are in patients in such circumstances. I watched all that the surgeon did with a fascinated intensity. I still recall with unwelcome vividness the spreading out of the instruments; the twisting of the tourniquet; the first incision; the fingering of the sawed bone; the sponge pressed on the flap; the tying of the blood-vessels; the stitching of the skin; and the bloody dismembered limb lying on the floor. Those are not pleasant remembrances. For a long time they haunted me, and even now they are easily resuscitated; and though they cannot bring back the suffering attending the events which gave them a place in my memory, they can occasion a suffering of their own, and be the cause of a disquiet which favors neither mental nor bodily health."

On the side of the surgeon, we find throughout the ages a constant effort to diminish the terrors of operations, and a continuous reprobation of the distressful, not to say cruel, modes of practice adopted by preceding generations. "Who can read without a kind of horror," cries Monfalcon, "the account of those frightful operations which were then practised? And yet the time is not very far distant from ours when they lopped off a limb by striking it violently with a heavy knife; that time when they knew neither how to stop nor how to prevent hemorrhage but by burning the part whence the blood jetted with boiling oil or the red-hot iron; that time when surgeons armed themselves at every moment with pincers, with burning cauteries, and with a thousand instruments the representations even of which cause terror." Will it happen that on the occasion of some future anniversary our successors will speak of our operative triumphs with the same scorn and abhorrence with which writers of the present day sometimes refer to the great deeds of our surgical forefathers?

The belief that operations might be rendered painless, and the hope that some means might be discovered by which this end should be accomplished, appear to have been present in the minds of surgeons from the earliest periods. Witness the accounts of the Memphis stone, described by Dioscorides and Pliny, which Littré surmised to have been merely marble, which by steeping in vinegar was made to give forth the fumes of carbonic acid; and of the mandragora, employed according to Theodoric, when mixed with other narcotics, by inhalation, and causing a sleep from which the patient could only be aroused by the fumes of vinegar; so profound was the stupor induced by this powerful drug that Bodin assures us that under its influence a man submitted without consciousness to a painful operation, and continued to sleep for several days thereafter. Vigo speaks of the whole body being "brought asleep by the smelling of a sponge wherein opium is," but warns his readers that the practice is dangerous because the use of opium is sometimes followed by gangrene. In his work on Natural Magic, Baptista Porta speaks of a volatile drug, kept in leaden vessels, which produced sleep when applied to the nostrils, and Perrin suggests that this may actually have been ether or some other of our modern anæsthetic agents.

Others endeavored to prevent the pain of operations by mechanical means. The Assyrians, Hoffmann assures us, compressed the veins of the neck apparently by tying a band around the part before practising circumcision, and compression of the carotid arteries was suggested as an anæsthetic measure in more modern times by Dr. Flemming; while still more recently Dr. Augustus Waller has shown that insensibility may be induced by compressing the cervical vagi. Garroters have indeed clearly shown, as remarked by Simpson, that a person may readily be choked into unconsciousness; but it is not surprising that their mode of practice has not commended itself to surgeons for general adoption. Compression of the limb by a fillet or tight ligature before amputation is referred to by Paré as a mode of alleviating the suffering which attends that procedure, and Benjamin Bell tells us that "in amputating limbs, patients frequently desire the tourniquet to be firmly screwed, from finding that it tends to diminish the pain of the operation." The same writer refers approvingly to the suggestion of Mr. James Moore that pain should be controlled by the application of a screw compressor to the principal nerve of the part, but surgeons generally appear to have agreed with Monfalcon that the inconveniences of such an apparatus fully equalled its very slight advantages.

Mental preoccupation was sometimes sought as a means of preventing pain. Richard Wiseman found that soldiers dreaded the loss of a limb much less if it were removed immediately, while they were in the "heat of fight," than if the operation were postponed until the next day; wherefore he says, "Cut it off quickly, while the soldier is heated and in mettle;" and Renauldin recalls the case of the amiable Dolomieu, who, exposed to the pangs of starvation in a Neapolitan dungeon, measurably alleviated his own

distress by engaging in the composition of a treatise on mineralogy, while his unfortunate servant and fellow-prisoner, who had not the same intellectual resources, was hungry enough for both.

But the presence of pain was not the only evil dreaded by our predecessors in attempting important operations: the great risk of fatal accident from some involuntary movement of the patient was constantly present to the mind of the conscientious surgeon. "How often," says Dr. Valentine Mott, "when operating in some deep, dark wound, along the course of some great vein, with thin walls, alternately distended and flaccid with the vital current, how often have I dreaded that some unfortunate struggle of the patient would deviate the knife a little from its proper course, and that I, who fain would be the deliverer, should involuntarily become the executioner, seeing my patient perish in my hands by the most appalling form of death! Had he been insensible, I should have felt no alarm." So greatly was the responsibility of using the knife felt by the best informed surgeons of preanæsthetic days that many, like Haller, distrusted their own manual dexterity, and declined to perform operations which, while recognizing their necessity, they felt should be left to other surgeons differently constituted from themselves. Would that a little of this Hallerian diffidence might affect some tyros of the profession in our own day, who, without the slightest preliminary practical training, do not hesitate to undertake the most hazardous procedures, and seem to consider themselves disgraced if they cannot count one or more abdominal sections, even if terminating fatally, within the accomplishments of their first year's practice!

Coming down to the days more immediately preceding the date of the great discovery, we find that opium and alcohol were the only agents which continued to be regarded as of practical value in diminishing the pain of operations, though the attendant disadvantages of their employment were of course recognized. "Previous to every painful operation," says Dorsey, "a dose of laudanum should be administered." "I was in the habit," says Dr. Mott, "of giving opiates freely before the introduction of anæsthetics, both before and after operations; . . . and opium and its preparations are the only anodynes well adapted to surgical use. No substitutes are worthy of confidence." Demme tells of a woman who, under the influence of opium, submitted to amputation at the hip-joint, and emitted but a single cry; and I myself recall distinctly patients who in the hands of that excellent surgeon, the late Dr. George W. Norris, had limbs amputated with almost no manifestation of pain when well charged previously with opium and whiskey. Alcohol, pushed to the point of producing intoxication, was employed as an anæsthetic by some surgeons, and Dorsey tell us that Dr. Physick, following Richerand's suggestion, used it successfully for its relaxing effect in a rebellious case of dislocated jaw, in which, on account of the patient's "extreme debility," it was not thought prudent to resort to the usual remedy,—"*bloodletting ad deliquium animi.*"

Meanwhile, facts were accumulating, the significance of which we can now plainly recognize, but which excited no attention at the time. Sir Humphry Davy had in the very early days of the nineteenth century experimented with nitrous oxide gas, afterwards employed by Horace Wells, and had in so many words suggested its use as an anæsthetic in minor operations; its power of preventing the sensation of pain was well known to many persons, and it was the custom at some of our medical schools—at the University of Pennsylvania for one—for students to breathe the “laughing gas,” as it was then called, for diversion. The use of ether by inhalation had been still earlier recommended by Beddoes, Pearson, and Thorton as a remedy for certain diseases of the lungs, and in 1805 your own Warren had employed it “to relieve the distress attending the last stage of pulmonary inflammation.” Its intoxicating qualities, when inhaled, and its power, when in sufficient concentration, to produce stupefaction, had been recognized in 1839 in Pereira’s well-known treatise on *materia medica*, and were quite familiar to American medical students; and it is no doubt possible—I certainly have no wish to deny it—that in isolated cases it may have been used as a means of relieving pain by individual practitioners, as by Dr. Long, of Athens, Georgia, whom Perrin, with that happy disregard of the geography of all countries except their own, which is characteristic of French writers, calls the “Greek physician.”

But yet—and yet—surgeons went on, in every country, cutting and burning, and patients went on writhing and screaming, until on the 16th day of October, in the year 1846, in the Massachusetts General Hospital, Dr. JOHN C. WARREN painlessly removed a tumor from a man who had previously been etherized by Dr. WILLIAM T. G. MORTON,—and Surgical Anæsthesia became the priceless heritage of the civilized world.

MECHANICAL WATER-FILTERS.¹

BY W. D. ROBINSON, M.D.,
Philadelphia.

MY excuse for writing on this subject is because of its hygienic importance and because of the volume of evidence existing, showing that but little correct or intelligent knowledge concerning it exists among the masses of the medical profession.

The general subject of water-filtration has been much agitated in the lay press, but little has been said to give clear understanding of mechanical water-filters themselves.

¹ Presented at the meeting of the American Climatological Association, at Lakewood, New Jersey, May 13, 1896.

The construction which is preferable from a mechanical consideration, and the many different media through which filtering is done, their relative advantages and defects have scarcely been discussed at all. It would seem that what knowledge is possessed by those who have given some thought to the subject, or who have purchased filters for their homes, has been merely derived from the very questionable statements made in the circulars of or arguments of agents advertising some special device. Seriously objectionable and weak points are well covered. A part of the whole truth is thus often very deceptive. The requirements requisite in a satisfactory water-filter, as enumerated by competent authorities, are:

1. That it should yield a sufficient supply of water free from color, of crystal-like transparency, and thoroughly free from all visible matter, also all micro-organisms and organic matter in solution.

2. The filtrate should be free from all taste derived either from the solution of anything introduced to facilitate the production of an apparent satisfactory product, or from the filtering media through which the water passes.

3. The filtered water should not be rendered insipid, flat, or lifeless in taste by the treatment it has been subjected to in filtration.

4. The filter should be so constructed as to assure the filtering media being readily, perfectly, automatically cleaned at very frequent intervals. After such cleansing it should at once yield a perfect filtered water, so that the house pipes may at no time have flow into the water that is only imperfectly filtered.

5. It should be readily taken apart, so that every portion could be gotten at when required.

6. It should have present in sufficient quantity a filtering medium having the power to destroy all organic matter in solution. This should be of a character capable of retaining its power for a long period of time.

7. It should also have a medium which would arrest all organisms and their spores, and all other matter in suspension invisible.

8. The filtering medium should yield nothing to water that would favor the growth of low forms of life, should it be contaminated by spores or organisms after filtration.

9. There should be nothing in the construction or part of the filter that could undergo putrefaction or yield metallic or other impurity to the filtrate.

10. The addition of chemicals or coagulants to prepare the water should not be permitted.

11. It should yield an abundant supply of filtered water.

12. It should be simple in construction and manipulation, and the cost sufficiently low in price to render it procurable by all classes of people. In pipe connections contaminations by sewer-gas should be rendered impossible.

When strong light is made to pass through unfiltered water, the sus-

pendent matter, which may be seen in the water by the unaided eye, is not its most objectionable constituent. The real disease-producing elements are pathogenic bacteria, their excretions, and the dissolved products of their decay after death.

Bacteria have the same functions as higher organized life; they breathe, eat, excrete, and multiply, and many have the power of moving about in the water. They differ somewhat in size, but as an average it is necessary for over a hundred to be agglutinated, as in a culture-growth, before a speck large enough to be seen by the human eye without a magnifying lens is formed.

The natural life of bacteria is usually only a question of hours if its food-supply is cut off. The spores or eggs of bacteria have a very tenacious covering, and are more difficult to destroy than any other form of organic life. A dry heat of from 329° to 340° F. applied for several hours or a steam-heat at 212° F. for over four hours is required to kill them. These facts are the most important to be kept in mind in considering water-filtration. The impurities in unfiltered water visible to the unaided eye and all stain and color may be removed by imperfect filtration. A filtrate of crystal-like clearness and very pleasing appearance may be yielded, and it still may be laden with the invisible disease-producing bacteria and organic products in solution. Such water with its hidden poison is like a wolf in lamb's clothing. If all bacteria and their spores could be removed from water so protected that none could be introduced afterwards, the visible impurities of the kinds usually found could be permitted to remain without danger of producing disease in those who drink it. The greatest ill derived from visible impurities lies in the fact that they supply the food necessary to the lives of the bacteria. If water is freed from impurities and the products already in solution, bacteria cannot live in it, but will soon die by starvation. Bacteria never develop spontaneously. When they are found present in water, or anywhere else, they or their spores of necessity must first have been introduced there from some infecting source.

As a slightly analytical illustration of what is usually contained in river water supplied to cities, and because the matter which has been suspended in the water is the real medium used for filtration in many popular filters, a partial list is given below of what was found by microscopic study of matter removed from city water-supply by a filter. This study is the work of J. D. MacDonald, M.D., R.M., F.R.S.

The matter removed contained of mineral matter fine grains of carbonate of calcium, sand, flint, iron-rust, earth, etc. Of vegetable products, pollen of many grasses and weeds, fine bits of partially decayed straw, grass, weeds, leaves, wood, etc., probably derived from manure which had been scattered abroad and washed or blown by the wind into the river. Of house-refuse matter, bits of linen, vegetable products, hemp-fibre, cotton, etc. Of animal products, the ova of many varieties of minute animals of earth, air, and water environment; minute parts of disintegrated and de-

caying bodies of animals of all sizes, such as part of a leg of cockroach, of house-fly, and spider; many bits of indistinguishable wings, hooklets, eyes, abdominal organs, eggs, skins, etc. Bits of mosquitoes, silk, wool, hair of animals in large variety, epithelium scales in variety, bits of decaying flesh of striped character foreign to fresh water, scales of insects, and minute parts of moths, caterpillars, butterflies, and many insects. Bacteria in over one hundred varieties. Gelatinous fronds with embedded bacteria growing in them. Over thirty types of diatoms. An endless number of types of low forms of organisms higher in order than bacteria. Many specimens of parts of low forms of animals in order of development up to and including insects. Innumerable other things not enumerated were found. The use of such material for making the bed to be used as the filtering medium suggests *similia similibus curantur*, or a dainty dish to set before a bacterium. The objections to a mass of such deposit, supported on a framework of coarse, granular material, as a filtering medium are so evident that it will not need further mention. When a filter with such a bed becomes clogged and has to be opened to clean it, it is common to find a revolting mass of putrid decay teeming with worm-life.

Filters on the market may be divided into four classes:

Those using as the filtering medium tubes made of various different powders, such as clay, diatomaceous earth, tripoli, etc., made into masses with flour, sugar, fine wood-dust, bread, etc., and formed and baked in kilns in the manner used in producing pottery-ware. The other variety of tubes is made from porous silicious rocks, which are very soft,—little harder than chalk. Tubes from this material are formed by the use of the turning lathe.

Next is the class of filters embracing those known as packed filters, which use no coagulant to prepare the water for filtration, and consist of one or more beds of granular material, such as animal and vegetable charcoal, magnetic carbide of iron, magnetic oxide of iron, coke, oxide of manganese, and polarite.

Next to consider are packed filters using preparatory chemical coagulants. These are usually packed with gravel, sand, ground flint, pumice-stone, ground glass, etc., all in grains too coarse to be effective without the preparatory coagulant.

Of the baked or natural stone-tube variety, that known as the Berkfeld, using as the base of its composition a special deposit of earth, found only in Germany, especially rich in diatoms, has proven by scientific tests the most efficacious in removing micro-organisms, and on this account was given a medal by the Franklin Institute of Philadelphia.

It is claimed that the bacteria contained in the water are caught in the microscopic furrows and rugæ which are characteristic of these shells.

The tubes are very soft and friable, and are difficult to scrub clean, and in a few days' time the bacteria grow through the pores to the outside of the tubes, and so contaminate the water, and also gradually so occlude the

tubes as to render them useless until cleaned. These tubes are made in Germany and are too expensive for general use.

Next are the Chamberland tubes of the Pasteur filter, well known on account of very extensive advertising, and supporting statements as to their efficacy from many general hygienists, physicians, and prominent educated men who seem to have accepted the statements of the vendors *cum grano salis*.

The most prominent and competent, experienced and unbiased bacteriologists in their works and lectures all teach that the Chamberland tubes of the Pasteur filter, even when without defects in the making or in their attachments in the filter case, are only effective in removing all micro-organisms from water for from three to four days, by which time the bacteria appear on the inside of the tubes.

All tube-filters, every third day, should have the tubes scrubbed and boiled or heated to about 360° F., or have filtered through them after scrubbing some form of solution containing chlorine, or one of permanganate of potassium, followed by a solution of oxalic acid, and, of course, afterwards washed by having a quantity of filtered water made to filter through.

The friction of water going through these pores enlarging them after a few years' continuous use, so as to permit bacteria to pass, and the effect on the size of the pores of a multiple of chemical cleansings by permanganate of potassium and oxalic acid or chlorine solutions, are points worthy of further investigation.

In times of bad water these tubes, if used to any great extent, become so clogged up and sealed over by deposits that they will yield water only in slow drops or often none at all, and consequently have to be scrubbed repeatedly during a single day. These tubes are very delicate, brittle, and friable, so that breakage is an element of material expense to consider.

These tubes are made only in one size, about eight inches long by one inch in diameter, and one-sixteenth of an inch in thickness, and cost probably not more than two to five cents, but cost the purchaser one dollar each.

If every tube is not accurately and tightly in its place after the cleaning, or if a tube has received a little crack in any manner, bacteria-laden water is sure to leak in and contaminate the filtrate.

While it is true that this filter is an excellent one, if it receives all the attention it requires and the small yield is sufficient, I have enumerated these facts because physicians in general and the laity have seemed to be educated to the full conviction that if they have water which has been filtered through a Pasteur filter it is therefore necessarily sterile of all micro-organisms,—which is incorrect.

No automatic device has been or can be constructed for successfully cleaning these tubes, for simple outside cleaning of them does not suffice, as each individual pore has to be cleansed and sterilized, which can only be done by heat or chemicals. As the care of the filter is almost invariably

left to servants, who do not understand its requirements and do not fulfil them, it becomes in general use a misplaced trust. It depends exclusively on its minute pores to remove foreign matter, and has no oxidizing or other chemical action on organic matter in solution. All solutions pass through these tubes, and, as the accumulations of micro-organisms on their outer side are deposited in an excellent culture-media, the colonies grow there rapidly. The chemical products eliminated from the live bacteria ptomaines from the decay of the dead bacteria all pass through these tubes into the filtered product.

Absorbed into animal bodies the pathogenic ptomaines give rise to that form of infection known as putrid intoxication. Selini has described a series of alkaloids resembling their physiological action,—atropine, morphine, curara.

Should a filter with much accumulation on the tubes be left for a few days, the first water afterwards passing through would almost assuredly contain an appreciable quantity of ptomaines in solution. The rapidity of the multiplication of bacteria seems to be rarely appreciated. Cohn states that under favorable conditions a bacterium becomes two at the end of an hour, which multiplication, if continued for forty-eight hours, would amount to over 280,000,000,000. This, however, never occurs to such an extent, as it is modified by their own produced ptomaines, but it indicates the absolute necessity of frequent and thorough cleansing of all mechanical water-filters. Unfiltered water contains about a hundred varieties of bacteria, of which but few are pathogenic. The pathogenic are those producing typhoid fever, cholera, tuberculosis, malaria, special types of diarrhœa, and a few other less important diseases.

Filters using tubes made from tripoli- or silica-stone have more porosity than the two kinds described, therefore yield a greater supply of water.

Their relative merits in preventing the passage of bacteria do not seem to have been very positively determined. In an advertising sheet issued by the vendors of the Pasteur filter a report is made by Hartley, sanitary chemist of Indiana, in which he states that the product of the Pasteur contained no bacteria, while samples from two filters using tripoli-stone tubes yielded growths from cultures after twenty-four hours. This report smacks of having been written for the purpose for which it is used, as he does not state whether the tripoli-stones were free from defects (a common fault) or whether the stones and all receptacles, etc., of the filtered water had been fully sterilized just before the test. Four days' use of his Pasteur tube would have caused cultures to produce growths.

Before considering the mechanism of the filters using granular filtering media, the media will be tersely studied.

They may be classified into porous grains possessing the power of destroying by oxidation organic substances in solution, and porous grains which do not possess such power. Ground pumice-stone is the principal granular substance of the latter class.

Next, non-porous grains acting purely mechanically by making small interspaces when packed together. The oxidizing powders are animal and wood charcoal, spongy iron, magnetic carbide of iron, polarite, and coke.

The non-oxidizing porous powders used are gravel, sand, flint, hard blue marble, garnet stone, glass, etc. No filter could be found which used these non-oxidizing, non-porous powders in grains sufficiently fine to be effective media of themselves. They all depended on accumulations in the interspaces and on top of the bed of such matter as had been removed from the unfiltered water. For the reasons (numbered 2, 3, 6, 7, 8, 9, and 10) enumerated in the requirements of a satisfactory filter, all filters of this class should be discarded. The non-oxidizing, non-porous powders, such as gravel and cracked or ground flint, marble, glass, and garnet stone, are the granular substances used in most filters of large capacity. Gravel is of little use, being too coarse. Sand, by reason of the endless attrition to which it has been subjected, has been so rounded in individual grains as to make the interspaces when it is packed together too nearly square and round openings. Openings of the same area if long and narrow are much more obstructive to suspended matter in water. The fracture of garnet stone is too ragged and irregular to produce the most effective interspaces. In fine-ground glass excellent interspaces are secured, but the possible danger from any minute particles of glass in any way getting into the filtered water renders its use objectionable.

Hard marble is excellent and it neutralizes any acids in the water, but if it is present in too large proportion it may harden the water perceptibly. A very hard, fine-cracked flint is the best of all these substances, and it makes an interspace very narrow and obstructive. The porosity of such a bed is very great, so that its water-yield is large.

Next are granular powders which produce a chemical oxidizing action on dissolved organic matter, and so destroy the food of the disease-producing contaminations of the water and such dissolved organic matter as is pathogenic. These powders are wood charcoal, animal or bone charcoal, spongy iron, magnetic carbide of iron, polarite, coke, etc.

For a long time the greatest faith was placed in charcoal, especially animal charcoal, as a purifier and sterilizer of water when used as a filter medium, and such still remains the conviction of many people unfamiliar with the facts proven by investigations of competent scientists by modern methods of research. The following are the facts about animal charcoal to which all authorities who have investigated agree: If packed closely, in form of fine grains, in liberal quantity, it will keep back micro-organisms and oxidize organic matter in solution for twelve days. After thirty to forty days the bacteria passing through are fully five times as plentiful as in the water before filtering; they have multiplied in the grains of bone-black and been given back to the filtered water. After this time the power of oxidizing the dissolved organic matter has become extinct and can only be removed by reburning the charcoal. Its power to oxidize organic sub-

stances is limited to dead or putrefying matter, for the gases from which it has a special affinity. Live matter, such as egg albumin, passes through unchanged. It contains phosphate of lime from the bones from which it is made; this is gradually given up by solution to the filtered water, rendering it a rich field for the development of micro-organisms. Filtered water from animal charcoal will not bear storing, but, as it affords the conditions and rich food for bacterial development, it soon becomes foul and filled with visible growths. It cannot be depended on to remove from water disease-poisons. It very soon becomes an infector instead of a purifier of water, only removing the color and visible suspended matter which are least prejudicial to health. If used at all in times of bad water, the filter should be repacked with fresh material every week, and under no conditions should the packing remain longer than a month. It cannot be cleansed by washing and passing solutions through the filter. For general household use it is a deception and an abomination, and should be discarded. This is the report of Chaumont and Natter, two of the greatest authorities known on hygiene and sanitary science. As regards animal charcoal for filtration their position is fully concurred in by all competent bacteriologists and hygienists.

Coke is sometimes used. It does not affect organic constituents in solution, and gives off sulphur compounds and other metallic or earthy impurities retained from the coal from which it was made. Of the iron compounds used for filter media the magnetic carbide—very porous and containing about twelve per cent. of carbon in combination—is not only the best of the iron compounds, but the best of all the oxidizers thus far discovered. It gives off nothing objectionable to the filtered water. If kept clean by means of previous grosser filtration of the water and by the frequent breaking up of the bed and attrition of each individual grain against its fellows or against intermixed fine-ground flint, by reversed currents of water being driven through it, it retains its oxidizing power almost indefinitely and is not itself destroyed. It is so finely porous that the area of its surfaces with which water may come in contact is very great. In its action of oxidizing organic matter it acts by its great magnetic carbonized metallic surface causing the decomposition of water, liberating hydrogen and oxygen. The oxygen as oxygen and as ozone—the oxide of oxygen—which is formed oxidizes and destroys dissolved organic matter, thus removing all food for bacteria and so quickly causing their extinction. Its action can be compared to a multitude of tiny stoves in which the organic matter occurs.

Polarite is an oxide of iron, both mixed and combined with silica and aluminum, and is very much slower than the magnetic carbide, in fact too slow to be an efficient oxidizing medium for use in a filter.

Such filtering media as asbestos-fibre, wood-pulp, or paper, cotton, or linen in any form, felt, etc., do not at all comply with the requirements enumerated as requisite for a satisfactory filter, and they should never be used.

The preparation of the water for filtration should in order be studied next. This is accomplished by the addition of chemicals to change the chemical and physical properties of impurities to be removed by filtration, that they may be separated much more easily. The chemicals used are styled coagulants, and are alum, sulphate of aluminum, permanganate of potassium, sulphate of iron, sulphate of copper, fluorine salts, etc. Of late nearly all have been abandoned but alum.

The dealers in filters using coagulants assure the public that the quantity of alum used is so small and that it is so entirely decomposed that none passes through the filter, and, therefore, its use is entirely free from deleterious effect. This, unfortunately, is only part of the truth, and, therefore, is deceptive. The vendors claim that but from one-fourth grain to one grain of alum is used to each gallon of water. The most reliable authors of books on hygiene say two to six grains of alum to the gallon are used. I have been unable to find any of the filters using alum which had an automatic alum cup,—that is, one which could only supply alum to the water when water is passing through the filter. In nearly all alum-using filters these cups are attached to the upper side of the pipe supplying unfiltered water to the filter, and they have a small opening into the pipe, the size of which opening is controlled by a handle attached without. It is claimed that as the water flows through the pipe when the filter is acting the water which has entered through this small opening to the lumps of alum in the cup has made a heavy concentrated solution which naturally sinks through the small opening into the water flowing past. Were the filter constantly in operation this would probably be correct, but when not in operation, as is usual during the night and at other times for a few hours, there is nothing to prevent the concentrated alum solution flowing constantly into the water in the supply-pipe. After such rest it is certain quite an increased quantity of alum will be contained in the water first flowing into the filter. Alum is very soluble,—one part in nine of water. An experimental test was made of placing an alum cup in a vessel containing one gallon of water so that the top of the cup was just submerged, and having the alum cup charged with one pound of alum broken in large pieces and the opening in the cup just the area of a hole made by a common domestic pin, and having it stand without the least agitation for twenty-four hours. A quantitative analysis of the gallon of water was then made to learn how much alum had passed into the water through the minute hole by the force of the diffusion of liquids of different specific gravity, and it was found to be eighty-two and one-half grains.

The chemical action of alum in water is as follows :

Alum is a sulphate of aluminum and potassium or ammonium containing an excess of sulphuric acid. Unfiltered water contains carbonate of calcium or lime in solution. In the chemical reaction the aluminum and potassium are replaced by the lime, by which hydrate of aluminum and potassium are formed and sulphate of calcium and some free sulphuric acid

are formed. The sulphate of lime and sulphuric acid remain in solution and the hydrate of alumina is precipitated. The action of alum on the organic matter is chemical, and as the reaction with the lime, except that the organized substances such as albumin take the place of potassium in the reaction and are precipitated with the hydrate of alumina. In these reactions the sulphates of lime and potassium and free sulphuric acid pass through into the filtrate. One hundred and seventy grains of sulphate of lime are soluble in one gallon of water. The hydrate of alumina is extremely insoluble, and is precipitated in minute particles, which quickly come together, forming little tufts and shreds, which aggregate and sink. By this mechanical process of the hydrate of aluminum the suspended matter is caught as if by a finely meshed net and carried down.

The action of the sulphate of calcium and free sulphuric acid can be very well demonstrated by its chemical action on metals with which it comes in contact, for which the sulphuric acid has a stronger affinity than for the calcium base. It is not unusual for the thin fine brass gauze or perforated brass metal which is at the bottom of the filter-bed to support it to be gradually corroded and destroyed by this acid and salt.

The hinge-joints in the devices for automatically closing the valves in the flush-tanks of water-closets have been so corroded as to stop their action. A cessation of the trouble was secured when the use of the alum in the filter was discontinued.

The physiological effect of the long-continued ingestion of this acid in filtered water is experienced—1, when water has not been drawn for some hours, so that an excessive quantity of alum passes through; 2, when by careless adjustment of supply-valve too great a quantity of alum is permitted to pass in; 3, when there is insufficient lime or organic matter to decompose all the alum, as occurs in soft water.

Many filters have been invented intended to be adapted to use of granular beds. Many cannot be properly cleaned in any easy way and are abominations. Others are constructed on incorrect theories and are inefficient. Others are mechanical monstrosities.

The main point sought for is to devise a successful automatic arrangement by which to clean the beds. No filter should use alum, especially if it has no automatic device by which the alum is cut off when the filter is not in use. Adapting all up-to-date and authoritatively proven facts and knowledge from experience to the construction of a mechanical water-filter, it should be as follows: It should be composed of at least three distinct and separate compartments. The unfiltered water should enter the first of these, in which should be removed practically all suspended matter. In the first compartment it should filter through a bed of fine cracked flint and hardest blue marble. In this bed the water is mechanically prepared for finer filtration and chemical purification from dissolved organic matter in the next. The second bed should consist of a liberal quantity of fine-grain, hardest variety of magnetic carbide of iron intermixed with a small

quantity of very fine cracked flint. The final bed should be composed of flint in grains very much finer than any that has ever heretofore been the custom to use in a filter. This can be made to pack together very closely, so that the interspaces will be mostly of the character of an enormous number of minute slots by reason of the smooth, flat surfaces lying in close apposition.

Such a fine bed as should be used would probably be very quickly cut off by the sealing effect of the gelatinous deposit formed on it, were the water not first filtered free from all visible suspended matter and thinned by destructive oxidation of all dissolved organic matter.

It should be possible to clean each bed separately, and at different times, without in the least disturbing either other bed. The last bed should be cleansed only with water which has filtered through the two preceding beds after they have been closely settled and packed together and are performing their parts of the work effectually.

The best method of cleaning would probably be by a device which would reverse the flow of water so that it should enter at the bottom of the bed. The device should form the water in columns such as is sent from a restricted elongated nozzle. The columns of water should be directed in spiral and other directions so that every particle of the bed may be broken up and violently churned and agitated.

By some device all confusing multiplicity of valves should be done away with, and, if possible, all actions be controlled by one compound valve, with the action at each position of each movement so plainly worded on the valve that no mistake could be made in its operation by any one who could read.

No alum or chemical coagulant should be used. There seems no good reason why the breadth of the interspaces in the last bed should not be as small as the diameter of the pores in a Chamberland tube. As necessity is the mother of invention—a mother who is ever fructifying—it is entirely possible that some such filter as described will be devised and perfected by some one possessing inventive skill.

A CLINICAL STUDY OF A CASE OF DOUBLE CHORIO-RETINITIS IN THE MACULAR REGIONS, FOLLOWING A FLASH OF LIGHTNING AND A FLASH FROM BURNING LYCOPODIUM.¹

BY CHARLES A. OLIVER, A.M., M.D.,

One of the Attending Surgeons to the Wills Eye Hospital; one of the Ophthalmic Surgeons to the Philadelphia Hospital, etc.

ON the 27th of April, 1894, A. P., a twenty-year-old engraver and artist, came to my clinic at the Wills Eye Hospital, complaining of muscular and accommodative asthenopias. A week later the total error of refraction was most carefully and repeatedly obtained during several days' time by the use of atropine. Two weeks were then allowed to elapse before the formula for glasses was given. During the intervening time medium smoked coquilles were constantly worn, and no manner of near work was attempted. The correction ordered, which was for low grade or compound hyperopic astigmatism, gave an acuity of vision and a power of accommodation that were normal in each eye. Extra-ocular muscle balance for both far and near was restored from a slight esophoria to proper equilibrium.

Just after the patient left the hospital with the formula for his glasses a violent electric and rain-storm suddenly appeared. The details of what now happened cannot be better given than in the exact words of the patient's own intelligent account.

"On May 28, after being at the hospital to have the glasses examined which were ordered by Dr. Prendergast, of Dr. Oliver's clinic, I started home at 3.30 P.M. A heavy storm came up and there was a great deal of lightning.

"While I was walking on Filbert Street, between Ninth and Tenth Streets, a flash of lightning which appeared like an electric arc light (that is, it was a blinding flash) passed from left to right in front of me.

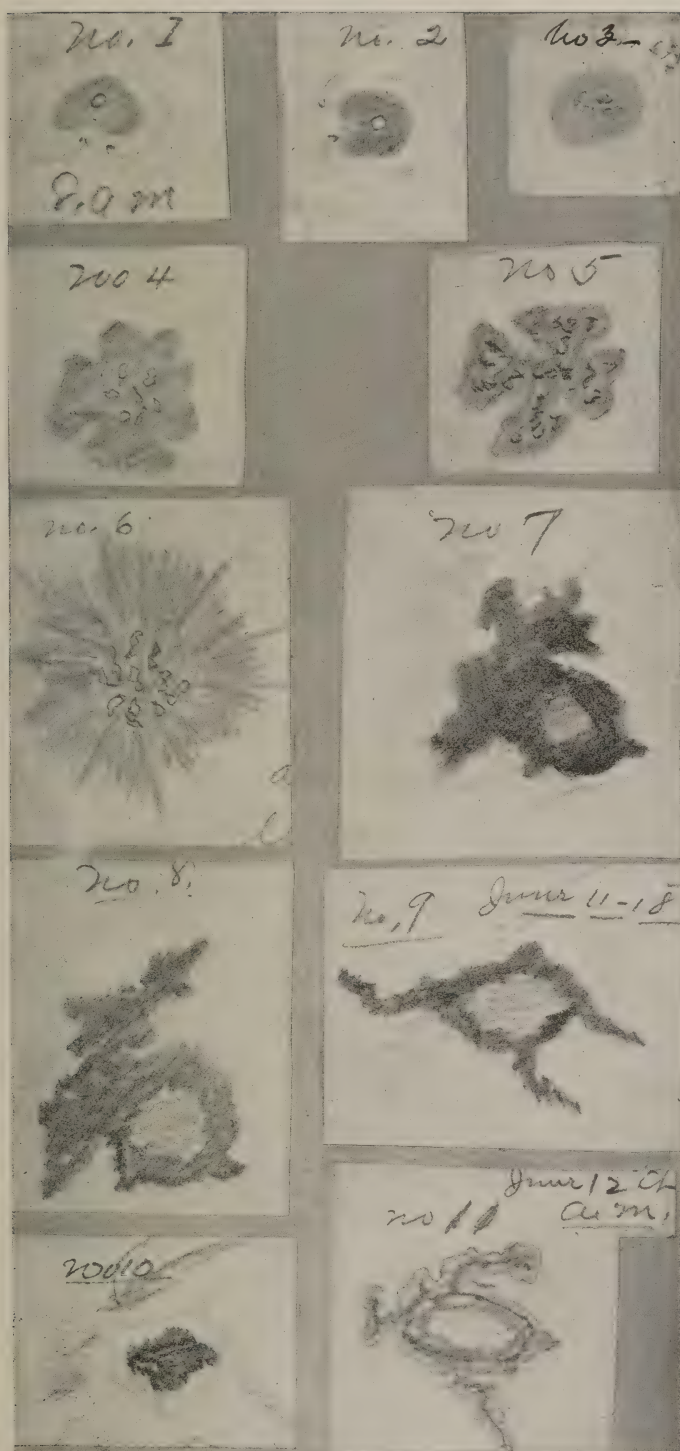
"A queer sensation came over me, and I thought every bone in my body was being wrenched from its joints, and I staggered. A horse, which was on the opposite side of the street fell, but regained his feet a moment later. For several moments I could not see; my eyesight came partially back, first in the left eye only. Gradually, in a minute or more's time, the sight returned in the right eye. I walked home apparently all right.

"That evening, about half-past nine o'clock, I was exposed to a flash of light from lycopodium coming in contact with burning alcohol. I went to bed and was so restless that I could not sleep.

"The following day I went to my work, which is that of engraving.

¹ Read before the 1896 meeting of the American Ophthalmological Society.

I.



Right eye.

I noticed on my work, or wherever I looked, that there was a small grayish spot. In the centre of this spot there was a second one about the size of a pin's head, and which was of the brightness of the sun. The central bright spot was fixed, while the grayish boundary moved rapidly in the direction shown by the arrows in the sketch.¹ (Plate I., No. 1.)

"At noon on the second day the spot changed to the shape shown in No. 2. The central spot was still bright, but the boundary was darker. The same character of motion continued as in No. 1, but it occupied a different position, as shown by the arrows.

"During the evening of the same day No. 2 spot changed entirely. The central spot, which remained bright, divided into four parts that kept constantly revolving in and through each other. The outer area had become fainter, and seemed to be made up of radiations, which rapidly moved from the centre to the edge in radiary waves. Both varieties of motion with the rapidity." (No. 3.)

The patient later stated that, during the time that these three figures were present, any series of narrow or closely-placed vertical lines would appear unequally corrugated like broken waves. The lower extremity of each broken line seemed to vibrate both to the right and left and to the left and right in a similar manner to the movement of a pendulum of a clock. Each excursion was short and the motion was very fast. The upper portions of the broken lines remained stationary.

On the afternoon of the 6th of June, just nine days after the accident, he came to me at the hospital, and I had my first opportunity of examining him. At this time he gave me the first seven sketches. He told me that the flash of lightning, which appeared purple, seemed to strike the pavement directly in front of him, and for several hours afterwards a grayish-colored area, which prevented him from seeing a man's head, persisted before each eye and then gradually disappeared. The lycopodium flash did not seem to leave any immediate after-effects. As noted in his own account of the case, the central scotomatous and irritation-area appeared on the following day and continued for seventy-two hours. For a period of three days he had very little if any trouble, although his employer had several times complained that his engraving was imperfectly done.

On the 3d of June, three days before I saw him, the irritation-scotoma again appeared before the right eye. As shown in No. 4, the patient stated that "the small brilliant spots had increased to seven, and the surrounding grayish area had become somewhat Maltese-cross shaped. The bright spots were constantly moving through one another like minute electric balls, without leaving any trail."

¹ "The spots are as I look at them, and are the exact size and shape. I have taken great pains in preparing these drawings, and they are correct."

(All of the succeeding subjective studies were made with the objects situated at twelve or more metres' distance from the eye.)

On the following day "the large spot, as partly shown in No. 5, which still remained fixed, became darker, and the included bright spots were changed into a great number of rapidly and irregularly moving hair-lines of brilliant light."

The succeeding day showed (No. 6) that a great change had taken place. The scotomatous area had become somewhat fainter, had increased in size, and had become stellate in form. The radii were massed into bundles that were situated upon different planes. The contained brilliantly-lighted lines were converted into eleven small spots of the same shape and size as the seven shown in No. 4. Like those in No. 4, the spots had become aggregated centrally, and were undergoing the same character of inosculating motion.

Early in the morning of the day that I saw him the remarkable change shown in No. 7 appeared. To quote from the patient's own written statement: "This change came suddenly. I had retired early the night previously, at which time the spot was like that shown in No. 6. I could not sleep much until towards morning. I arose at seven o'clock, when, to my surprise, the spot was like that shown in No. 7. The slightly eccentric light area was not brilliant, but had the appearance of frosted glass. The surrounding area was as black as ink. The large faint peripheral area seemed to me like a fog. The entire mass was motionless."

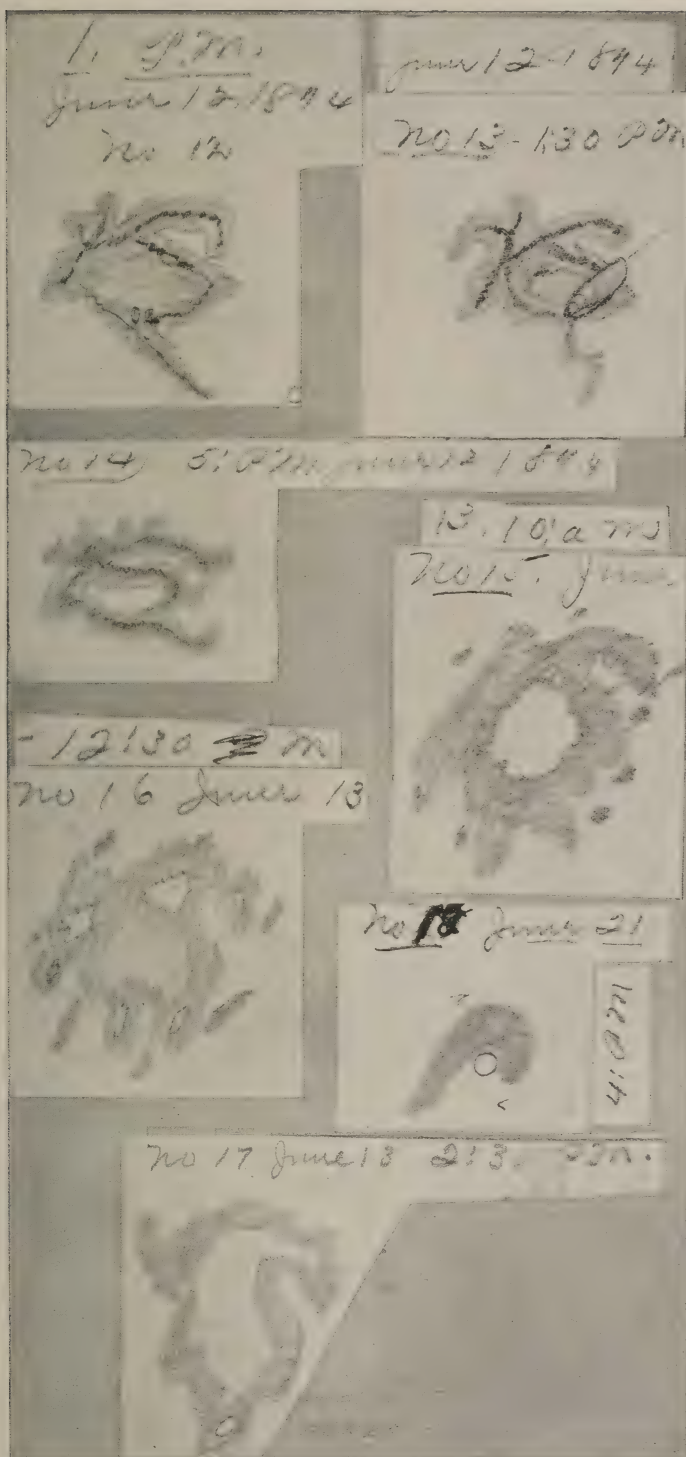
He stated that any decided movement of the left eye produced a deep-seated pain in that organ.

Central vision for form with the right eye was reduced to one-fortieth of normal. The field of vision, which was normal in size, gave marked evidences of a large irregular central scotoma that was absolute for both form and color. The pupil was the same size as that of the fellow apparently undisturbed eye, and the iris was as freely mobile to light-stimulus, accommodation, and convergence as its fellow. The left eye seemed normal in every respect. The ophthalmoscope revealed a most striking and never-to-be-forgotten picture in the right retina. Directly in the macular region the retinal tissue seemed to be slightly puffed into an irregularly flattened mass. The tissue itself did not appear to be discolored or opaque, but glistened in places as though the underlying material were composed of an extremely thin coating of cicatrizing, almost transparent jelly. No hemorrhages of any character could be detected, and no signs of degeneration of any type, except that the nerve-head was a trifle hazy and gray, could be determined.

The retina of the left eye apparently was not affected in any way, except that here, too, the nerve-head was a trifle too gray for age and was somewhat hazy.

The patient, who seemed strong and hearty, strenuously denied any syphilitic infection, and after the most careful physical examination failed to present any evidence of the disease. The only obtainable history of

II.



Right eye.

systemic disturbance was that of infrequent attacks of muscular rheumatism.

In order to study the rapidly-changing symptoms, and to give his eyes a thorough rest, I admitted him into the hospital, put him to bed, and lightly, though effectually, bandaged his eyes, so as to exclude all extraneous light from their interiors. I immediately placed him upon the free use of alteratives, thoroughly purged him, and gave him light, nutritious diet.

The examinations were continued unremittingly each day, care being taken to give each eye a thorough rest before every new procedure.

On the second day of his stay in the hospital he observed that the scotomatous area had undergone a marked change for the better. This is shown in No. 8. In his own words, "There is some change in the general shape of the spot. The small white spot is a little larger, and the surrounding black area is a little lighter. The foggy appearance around the spot has disappeared." He complained that the eyeball pained him considerably. Both central and peripheral vision practically remained as before.

To his great dismay, he, for the first time since the primary momentary blinding at the time of the accident, noticed a central scotoma before the left eye. (Plate V., Fig. A.¹) He informed me that "it had appeared synchronously with the twisted, snake-like appearance before the right eye. To him it closely resembled drawing No. 3 seen with the right eye, and had the same characters of motion.

On the 11th of June, at my suggestion, he presented me with two very interesting sketches.

The scotomatous areas, studied in his ordinary way of projecting them against a distant white background,—as, for example, the clouds, a white shutter, or a pane of ground glass,—now gave him the peculiar appearance shown in No. 9. As he remarked in his report, "The color is the same as that in No. 8, but the light place in the centre is larger, and I can see a very little through it." Acting upon this suggestion, I thought that I would try and see whether any increase in the distant illumination would make a change. To his great surprise, when I had him gaze at a large area of rather brilliant orange-yellow light obtained from ordinary illuminating gas, he found that the previous light central area in the scotoma became absolutely black, and the peripheral area, which was extremely black in the previous experiment, now became quite faint and "pearl-colored." No. 10 shows very well what is meant. Several times during the experimentation, when the patient looked away from the flame, several brilliant triangular bodies which were in rapid vibration appeared in the scotomatous area.

¹ In order to more readily differentiate the varying scotomata in the two eyes, all those that belong to the right eye have been numbered, and all those that were seen by the left eye have been alphabetically arranged.

A careful drawing of the appearance of the same series of vertical lines that he had experimented with before his admission into the wards of the hospital gave the projection of a scotomatous area that was similarly shaped to No. 9 directly upon them. A peculiarity, however, that he noticed was that the lower extremity of every one of the lines above the scotoma was barbed upwardly and to the left, and the upper extremity of each of the lines below the scotoma was barbed downwardly and to the left.

On this day the general form of the scotoma before the left eye had changed to the area shown in Fig. B. The six small brilliant spots kept moving in the same manner as the spots in No. 7.

At his own request, I discharged him from the wards to the dispensary service of the hospital, ordering him to take twenty grains of iodide of potassium three times daily.

On the next morning (the 12th of June) the scotoma presented the appearance shown in No. 11. As can be seen, "the foggy atmosphere," as he was wont to call it, in which the scotoma was situated, had disappeared. The central light area had greatly cleared, and the entire spot had become fainter, this being marked by "a heavy dark vein" which ran through the central portion of the larger dark area.

At 1 P.M. of the same day the patient made a sketch shown in No. 12, and noted: "There is some change in shape, but not in color. There are two bright spots, like miniature suns, in the lower portion of the spot, and these, which are constantly vibrating, are exceedingly annoying. The eye pains me, and seems quite inflamed."

Half an hour later the sketch of No. 13 was made. In the patient's diary I find: "The dark spot is about the same shape, but it is lighter. One bright spot has disappeared. The remaining one, instead of vibrating, throws a light up across the light area beyond the scotomatous area, leaving a series of overlapping concentric rings, somewhat like the tail of a comet."

At 5 P.M. of the same day he made the sketch for No. 14, writing: "This makes the fourth change in one day,—the most that have taken place in one day. The bright spot has gone. I can see through the small central opening, but very dimly, as though it were covered with frosted glass. Everything seen through it, though not distorted, seems to be small and very far away."

The sketch of No. 15 was made at ten o'clock the next morning. To use the patient's own language: "This morning another change has taken place, both in size and shape of the spot. It is larger, but is not any darker, than that of the previous sketch. The whole area appears like a piece of isinglass, but I cannot trace the shape correctly. By closing the eye rapidly I can see the shape. The opening is a little clearer. All objects are very small and dim. The eight small spots outside appear as though they were broken-off particles of the large spot. They are fixed."

At 12.30, at noon, he made another most interesting sketch, shown in



Right eye.

No. 16, and wrote: "Another change both in shape and size has appeared. The light spots have lessened to six, and instead of one large opening in the central blind area there is a more irregular and dimmer somewhat central one, surrounded by six little ones, four of which are situated in the prolongations."

Two hours later sketch for No. 17 was made. Describing it, he said, "Another change, both in size and shape; all of the small areas have disappeared from the outside of the spot. The sieve-like openings in the large area have all, with the exception of the lower inner one, broadened into a large central light area partaking somewhat of the same general configuration of the large dimmed area."

During this day he made two very instructive sketches, one of which was practically No. 17 projected against a series of narrow vertical lines. Not only was the scotomatous area present, but the lines themselves in the region of the scotoma were smaller, finer, and more closely packed together, thus substantiating his assertion that all objects looked at through the spot were smaller.

A curious sketch showed that a vertically held string bulged forward and appeared somewhat attenuated in front of the scotomatous area. A drawing of a horizontally placed rectangle, made while looking at the object with the right eye, exhibited the same characteristic metamorphopsia and micropsia. The ophthalmoscope showed that the macular region was surrounded by a most curiously irregular and shining rim, the enclosed area being markedly depressed in places and quite pallid, especially the fovea itself.

On the 18th of June the left scotoma, as shown in Fig. C, appeared to be divided into four dull areas "which are in constant motion. The six vibrating, brilliantly-lighted spots have disappeared."

Three days later (21st of June), at 4 P.M., the sketch shown in No. 18 came into existence. As the patient wrote: "This is the most peculiar shape and motion that I have had. It is about as dark as drawing No. 5. The small central clear spot which is fixed is about as bright as an electric arc light. The dark coma-like area surrounding it moves around the light spot in the direction shown by the arrows at about the rate of two revolutions per second. In a dark room the small central spot appears jet black and the large surrounding area is pearl white in tint. The same motion persists."

The appearance of the vertical lines at this time was so extraordinary that they are here reproduced in No. 19.

At this visit it was found that vision in the right eye had tripled $\frac{3}{40}$ whilst that of the left eye equalled full $\frac{5}{5}$. Although there were some evidences of iodism, I continued the drug just as before.

On the following day (22d of June) the spot appeared as if split into two sections and the bright area had gone (No. 20). The patient's notes state: "I cannot draw the shape of the spots unless I close the eye rapidly. They are in constant motion, like the one shown in drawing No. 3."

The vertical lines had undergone a marked change. They were not so broken, and the heavy, dense, horizontal thickenings were replaced by six broad, faint horizontal smudges.

The right fundus in the macular region seemed to have regained its natural tint, though careful focussing revealed the presence of a few faint and almost imperceptible, deeply-seated pigment splotchings and aggregations.

On the 24th of June a most curious paræsthetic area, represented in No. 21, appeared. Of this the patient wrote, "This shape stayed only for about one hour, fading to the shape shown in drawing No. 18. It has the appearance of waves of light composed of fixed radii which pass outwardly from the centre. These waves elevate and depress themselves from the centre just the same as if one threw a stone into the water,—the waves flowing from where the stone struck the water; so here the spot is similar to the waves, except that being water they are waves of light. Central vision with the right eye equalled $\frac{1\frac{1}{2}}{10}$, eccentrically it rose to $\frac{5}{15}$."

On the 29th of June the sketch shown in No. 22 was made. The figure is that of a man smoking a cigar and carrying a cane as he was leaving the patient. "The white area represents the man as he appeared with the right eye while I was looking at the middle of his back. The surrounding shaded area shows him as I know what he should be."

Central vision directly ahead with the left eye equalled one-half of normal ($\frac{5}{10}$).

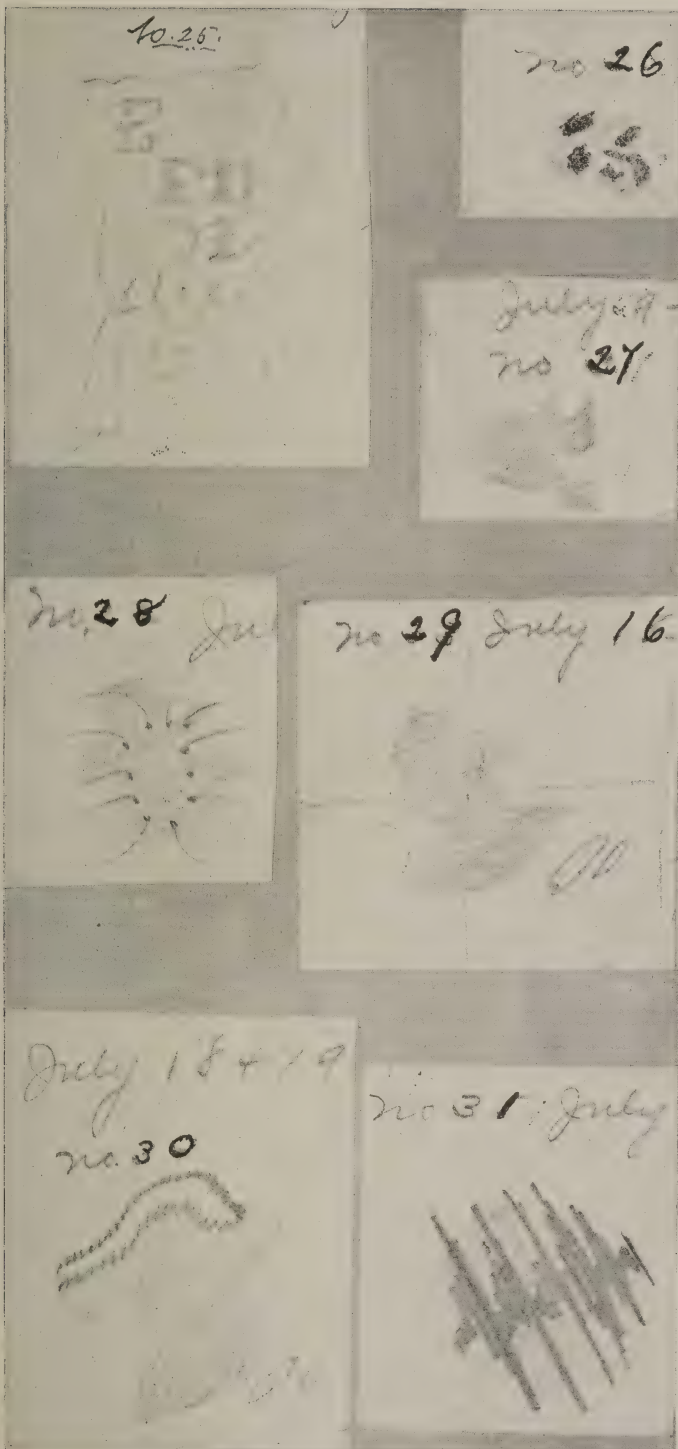
I did not see the patient again until the 2d of July. He said that he had taken the tri-daily dose of twenty grains of iodide of potassium faithfully and had not attempted to use his eyes in any way, being careful to wear his smoked glasses constantly.

At this visit he drew the sketch represented in Nos. 23 and 24. The scotomata had become fixed and all objects appeared "very small." His comments as to the sketch are as follows: "Now you can see a great difference in the two areas in regard to shape and size and the dense dark spots over them. No. 23 has eight small black spots; No. 24 has eight also, but they cut across the whole area from left to right as a series of stripes. When these bands or stripes first appeared it seemed to me that the spots actually lengthened themselves out to become stripes."

Four days later I had him make a sketch of my card of test-type which was hanging on the wall at about two metres' distance. The result is shown in No. 25. The noting at the side of the drawing read: "This shows the appearance of Dr. Oliver's card while I am looking at the letter 'O' in the upper right-hand corner."

On the 8th of July he came back very much disturbed, saying that, although the size of the general area was diminished and the dense superimposed spots reduced to five, yet these were in such a state of constant motion, just as they had been in No. 3, as to be annoying. The appearance of the fixed and superimposed mobile scotomata is shown in Fig. 26.

IV.



Right eye.

He voluntarily stated that during heavy thunder-storms, where there is much lightning, he gets demoralized and "must get into a dark room so as to prevent the right eyeball from jerking and twisting in its socket."

The next day, to his gratification, the five spots disappeared, but the gray area upon which they had seemed to rest had grown somewhat larger. No. 27 shows this very well.

On account of pronounced iodism I stopped the iodide, ordering him full doses of strychnine instead.

I missed him for another week, when he came back with the assertion that he had ignored the strychnine and had unremittingly continued his tri-daily dose of twenty grains of iodide of potassium. In spite of the marked iodism I persisted in the use of the drug.

The bright mobile spots had once more come to trouble him. The morning of his visit he had the appearance shown in No. 28.

He said that while sketching the scotomatous boundary "several bright spots shot in towards the centre from the outer edge like roman candles; in fact, they resembled them very much. After striking the centre they disappeared. This phenomenon lasted for about one minute."

Some hours after this he accidentally found that, while gazing down upon a white marble floor and drawing the scotomatous area, two eccentrically situated and fixed bright areas of light, just as "when the sun shines through the slat-work of a shutter," were projected upon the floor. The position of these light areas and the central scotomatous area are shown in No. 29.

Notwithstanding the scotoma, the eccentric vision up and in in the right eye had increased to about two-thirds of normal ($\frac{5}{7\frac{1}{2}}$).

On the succeeding second and third days the central dim area which stayed fixed became larger. The eccentric light areas, first noticed on the 16th of the month, remained equally bright, but had become a trifle smaller. At the upper border of the large dim area a brilliant and serrated worm-like mass kept in constant motion. This can be seen in No. 30.

"During the afternoon of the third day the two bright spots in the lower right-hand corner disappeared," and immediately the dense black strokes shown in No. 31 came on, they first being "lightish" and gradually becoming "darker." By the 18th of the month the four faint scotomatous areas before the left eye had practically gone. I found, however, by reference to his notes, these words: "While lying in bed on the night of this date, and being unable to sleep and very restless, I looked up at the moon, when slightly down and out from it there were two somewhat luminous objects in the sky. These were stretched out vertically, quite close to each other, and moved around the moon as I moved my head in the same direction."

One week later the spot before the left eye again came into evidence. At this time all objects immediately below the fixation point were obscured. A drawing of a man's face in profile made while he was looking at the

top of the model's nose placed the mouth and chin in the scotomatous area. Fig. D, showing the appearance of my card of distant test-type when the patient was looking at "E" "O" on the top line, will explain very well what is meant.

On the 30th of the month he told me that the objects seen through the comparatively clear areas were much larger and more nearly what they should be than before.

The notes of the 5th of September state that he was taking eighty grains of iodide of potassium daily with impunity, he having a good appetite. Nothing noteworthy was apparent until this date, when a minute, fresh hemorrhage, with its convexity directed upward, could be seen just below the left fovea, between the retina and the chorioid. The macular region of the right retina was faintly granular and slightly pigmented.

He stated that the left eye had become painful during the previous night, and when he had gotten up and lit the gas he found that there was a dense black spot in the centre of its field of vision.

On the 10th of September he found that the left scotoma had become reduced, in his own words, "to a lot of faint spots, which, as near as I can explain, look like drops of water slowly flowing down a pane of glass, one trying to beat the other."

On the same day, without warning, a dim representation of No. 21, seen on the 24th of June, appeared before the right eye, and lasted for about twenty-four hours.

On the following morning he noticed that the large, dim scotoma before the right eye, which has been so persistent and fixed during the summer months, recurred; but, curiously, its edges seemed broken away and lost. Through this area, and in no other position in the field of fixation, was there any complaint of micropsia. The scotoma gradually became faintly mottled, and at last decreased in density, until a drawing made on the 9th of October showed that the area was barely discernible.

At this visit he brought sketch of Fig. E, which, as he said, showed "the shape, size, and shade of the spots in the left eye. There is no motion whatever."

After a most rigorous examination no cardiac or renal lesion could be determined. Vision in the right eye had risen to one-half of normal, while that in the left eye was normal. When the patient regarded any object fixedly with the left eye the image of the object became alternately larger and smaller, and seemed distorted upon its edges, just "as though it were viewed through a convex lens which is successively elevated and depressed." The subretinal hemorrhage in the left eye was beginning to manifest evidences of beginning absorption.

Two weeks later the ophthalmoscope showed that there were a few faint pigment-spots in the right retina, and that the minute hemorrhage in the left subretinal tissue was nearly gone, the retina in the macular region being elevated and depressed into several almost imperceptible striæ. The

Fig. A

June 8-94

25
 26
 27
 28
 29
 30

Fig. B.

June 11

00
 00
 00

Fig. C.

June 21.

10
 11
 12
 13
 14
 15

Fig. D

mura

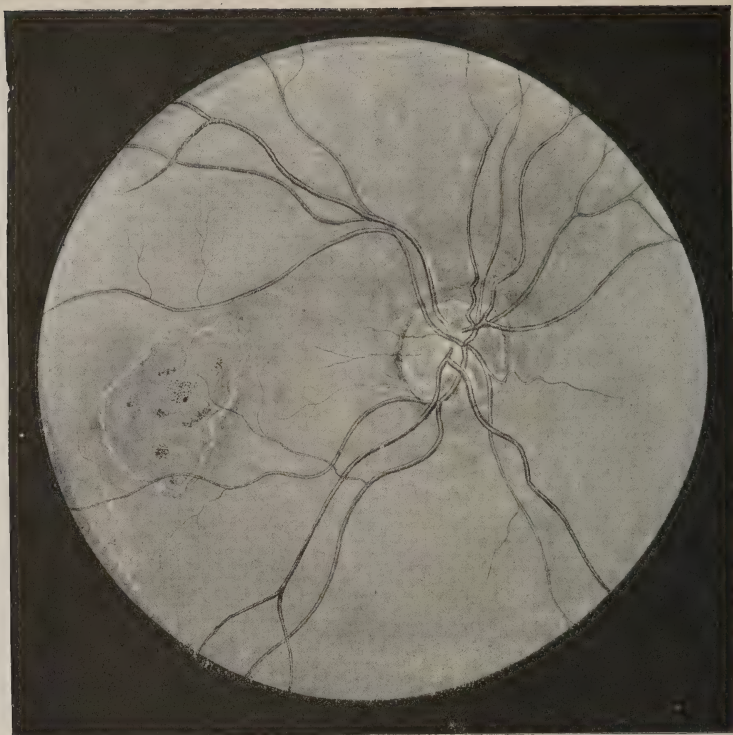
E O
 C E T

D F U L
 T D E O F
 etc

Fig. E

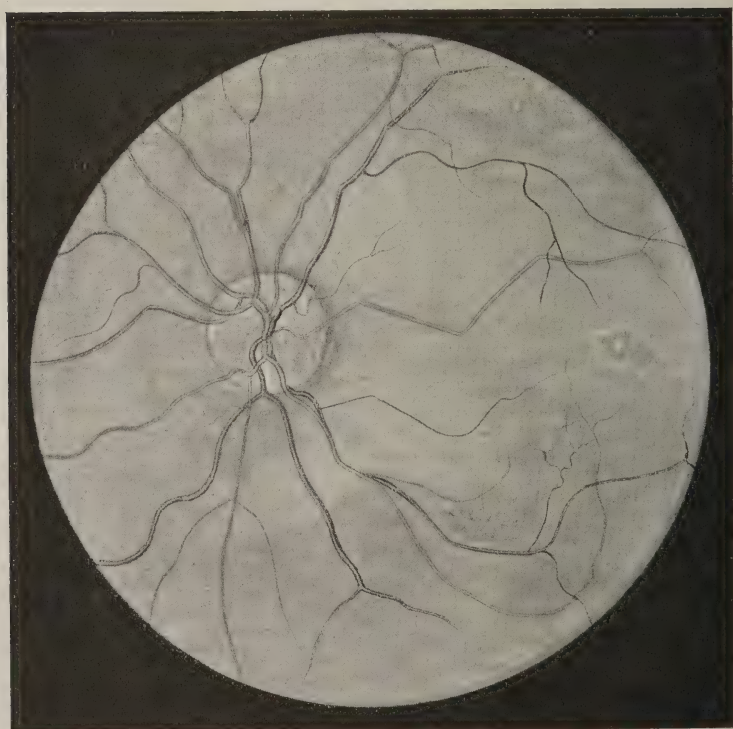
9.11.94.

FIG. 1.



Ophthalmoscopic appearance of right eye-ground.

FIG. 2.



Ophthalmoscopic appearance of left eye-ground.

patient stated that he had not used any alternative for more than a week. He was told to discontinue its use.

On the 17th of October he returned with the statement that the day before he had attempted to resume his work, but found that he was compelled to desist on account of the annoying distortion and dimness of objects. A most careful correction of his minor degree of astigmatism, obtained both with and without the employment of a mydriatic, failed to relieve the condition in any way.

During the month of November he returned several times. On the 26th of the month he made some sketches showing the contracting effects upon long, narrow, rectangular forms placed at different angles in the scotomatous areas. These, which were most numerous and ingenious, will be reserved for another paper upon a related subject.

In January, 1895, the scotoma in the right eye could be just seen. He wrote, "Vertical lines are not broken or drawn together, and objects seem very little distorted." The accompanying reproductions of two faithful water-color sketches (Figs. 1 and 2) by Miss Margarett Washington, of this city, were secured about this time. The relative conditions seen are so self-evident that written description is rendered unnecessary. The iodide of potassium was persistently continued, as much as possible, attacks of iodism, coming on very quickly and persistently, requiring constant counter-medication.

Once in February he returned with a slight, though temporary, increase in dimness in the right scotoma. At this visit he told me that the left one "had preserved the same shape and shade, but that the smaller spots were plainer (darker) and seemed to be increased in number."

His statement that at times there was some supraorbital neuralgia, and that frequently there was an irregular and vibrating mesh-work thrown between the left eye and the object looked at, induced me to make a most careful, though fruitless, examination of the media and muscular apparatus of the organ. Central vision with the right eye had steadily risen to one-fourth of normal ($\frac{5}{20}$), while that of the left eye was practically normal.

The dose of iodide of potassium, which had been taken with more or less regularity, was reduced to five grains three times daily.

On March 27 of last year, in order that I should better realize the relative difference between the two sights, he gave me two rough sketches of the same object studied from the same objective point, nearly four blocks away (the statue of William Penn upon the City Hall in Philadelphia). When study is made of these, which are reproduced in the full-page photo-type (Plate VI.), it will be instantly noticed that (with the same minor degree of refractive error) the image of the right eye is much the smaller, thus substantiating in another and most graphic way his constantly-repeated assertions of micropsia. The projections of the faint scotomatous areas against the head and back of the figure and the larger size of the left scotoma are all most interesting and instructive.

In September, 1895, he returned for the removal of some dirt that had blown into his left conjunctival cul-de-sac. At that visit I embraced the opportunity of restudying his case. His vision, which was central in each eye, had risen to two-thirds of normal in the right eye and to full acuity in the left. Accommodative power and play were equally good in each eye.

He considered his right eye well. At times water-like globules would appear in the centre of the left field of vision. Careful focussing with the ophthalmoscope revealed the faintest traces of the macular changes shown in Miss Washington's sketches.

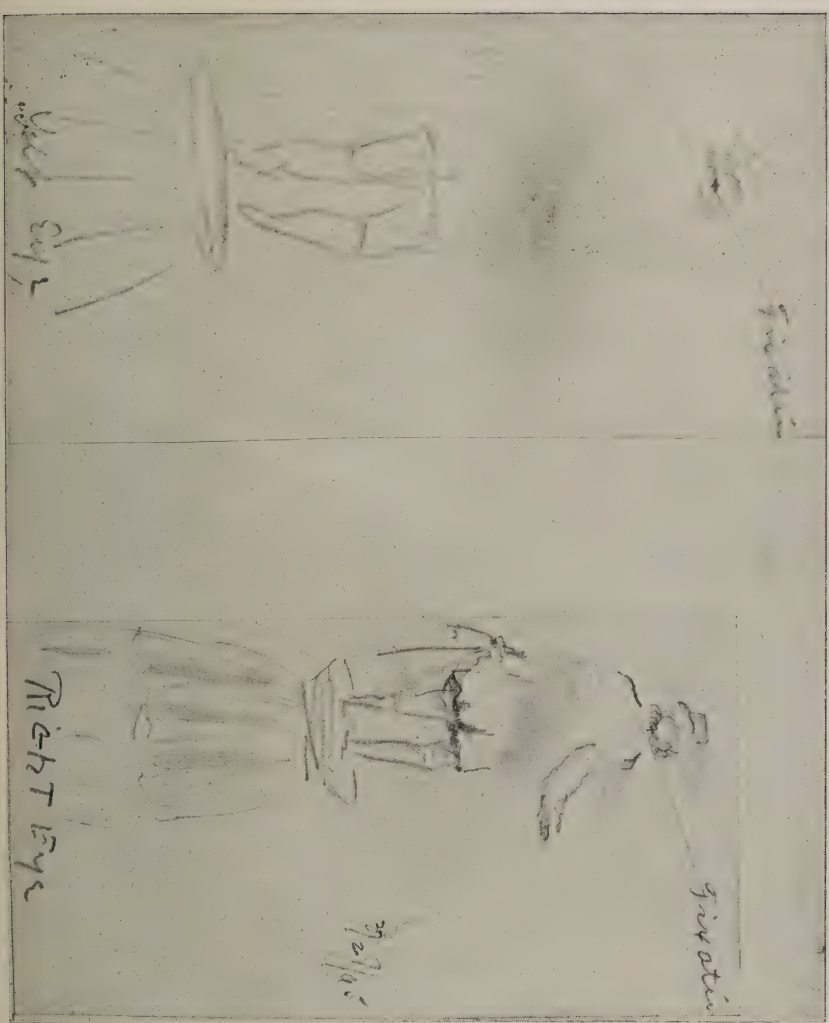
An extended re-examination the beginning of this month (July, 1896) gave practically the same findings as were noted ten months previously. A final series of characteristic sketches of geometrical forms, in which the distance between any two parallel lines (especially the horizontal ones) was made very small, showed minor degrees of bulging just at the fixation-point with the right eye, and rather more marked elevation and depression of the entire widths between the two lines away from the fixation-point with the left eye. He is now unable to project any scotoma, "any mark, blur, or spot" with the right eye, "except by looking up at a clear sky, and then only a very faint outline of the old spot appeared."

With the left eye he can project a few extremely attenuated and almost invisible grayish scotomata around and especially above the macular region, these in the carefully taken corresponding field of vision being evidenced by the faintest dim areas for color and form. The field of vision of the right eye fails to show any scotomata, but in a small area about three degrees above the fixation-point extremely minute and circular test objects appear elongated into a vertical oval.

The fields of vision, which were frequently repeated during these studies, at no time evidenced any contraction in the peripheral boundaries, the central scotomata, which were constantly absolute for color and at times negative for form, always agreeing with those that the patient made in the sketches from which the figures were taken.

REMARKS.—The present case is here given in its minutest details in order that an almost unique instance of intelligent subjective study, in combination with a fairly well-made series of clinical researches and an exact graphic reproduction of the intraocular lesion found, might be made use of by others in their studies upon such comparatively rare and quickly evanescent symptom-groupings. Uncomplicated, having been seen but a few minutes before the accident, studied carefully, and watched almost incessantly, the case assumes a certainty that entitles it to consideration.

Although the literature upon the subject has been well searched over, and much that has been done by others has not been attempted here, yet with this latter shortcoming, this clinical study is given to the ophthalmic world in the hope that it may be not altogether fruitless and useless.



The writer here desires to express his obligation to the patient himself for his untiring aid and conscientious study of the constantly varying symptoms, without which help much of the interest and value of the paper would have been lost. To the writer's several clinical assistants, especially to Dr. William Campbell Posey, his official assistant at the hospital, much credit must be given for their skilful and careful clinical handling of the case.

*THE URIC ACID DIATHESIS AND ITS EFFECT UPON
THE UPPER RESPIRATORY TRACT.¹*

BY WILLIAM F. DUDLEY, M.D.,

Brooklyn, N. Y.

It is proposed to briefly consider the factors productive of an excess of the uric acid group in the blood, and to state the effects of this dyscrasia upon the nose and throat. I venture to broach so vast a subject as the uric acid diathesis, because without an appreciation of its etiology it would be impossible to understand and relieve those of its symptoms which are evinced in the upper respiratory tract.

That uric acid exists in the blood in certain diseases is generally conceded. Garrod² proved this in 1848 by his thread experiment. He suspended a thread in fresh serum, obtained from the blood of a gouty subject, acidulated it with acetic acid, and after forty-eight hours' immersion the thread was discovered to be coated with crystals of uric acid. Levison³ enhanced the value of this demonstration by suspending threads in ascitic fluid, and gradually adding uric acid. He found that a one to four-thousand solution deposited no crystals on the thread, a one to two-thousand solution gave up a few crystals, and a one to one-thousand solution covered the thread with a large number of crystals.

Von Jaksch⁴ examined the blood of a number of diseased person with varying results. Twenty-one cases of diseases of the nervous system showed no uric acid in the blood. In ten typhoids none was found. In seven cases of anæmia with increase of the number of leucocytes, uric acid was found. Nine cases of Bright's disease out of eleven examined yielded a considerable quantity of uric acid. That uric acid cannot be estimated in healthy blood is due to the difficulty of obtaining the large quantities required for the analysis and to the rapid chemical combinations that take

¹ Read before the American Climatological Association, May 12, 1896.

² Garrod, *A Treatise on Gout and Rheumatism*, 1876.

³ F. Levison, *The Uric Acid Diathesis*, p. 40.

⁴ Von Jaksch, *Ueber die klinische Bedeutung von Harnsäure im Blut*, 1890.

place. But it has been proved conclusively by Horbaczewski¹ that uric acid can be derived from the tissues of nearly all the organs in man and in lower animals. The lungs, liver, mucous membrane of the intestines, and the spleen all yielded this substance; in the latter organ two and a half milligrammes of uric acid were produced from one gramme of spleen pulp. He extracted the nuclein from each tissue to be examined by artificial digestion, and from the nuclein obtained he derived xanthin, hypoxanthin, and uric acid.

Horbaczewski has shown by his accurate experiments that body tissues that contain no free uric acid nevertheless possess a nitrogenous substance from which it can be artificially extracted, and from which it is fair to presume uric acid is evolved during life. This substance is the nuclein of cells, and this he regards as the generator of uric acid. He found further that nuclein introduced into the body, either in the food or in a weak alkaline solution hypodermically, increased the amount of uric acid eliminated. One-fourth gramme of nuclein was injected into a rabbit normally excreting seven milligrammes of uric acid daily, and in the following twenty-four hours twenty-five and eight-tenths milligrammes of uric acid were found in the urine.

Maress² administered five and one-half grammes of nuclein to a man deprived of food for the previous eighteen hours, nuclein being more effective while fasting. During the two hours before taking the nuclein, eighty-one cubic centimetres of urine contained forty-six milligrammes of uric acid, and during the fourth and fifth hour after taking the nuclein one hundred and forty-eight cubic centimetres of urine yielded ninety-three milligrammes of uric acid.

Levison, in his book on "The Uric Acid Diathesis," from which the data given have been taken, states that it is impossible that the characteristic cells of the tissues can be so rapidly disintegrated as to produce such marked variations of uric acid as occur during life, and believes that *leucocytes*, which are omnipresent in the body, are the cells which undergo metamorphosis, and that they furnish the uric acid, and are, therefore, the key to the solution of the problem. Thus he explains the increase of uric acid found after eating as due to a temporary leucocytosis, from digestive activity occurring before it is possible for the increase to be derived from the ingested food, that not having been assimilated.

In young children's blood leucocytes are much more numerous normally than in later life; and in infant's urine the relation of uric acid to urea is one to nine, whereas in adults it is one to thirty or thirty-five.

Tyson³ says the most frequent sediment in the new-born is uric acid, and red and sand-like crystals are at times found in the first urine discharged.

¹ Horbaczewski, reported by Levison, loc. cit., p. 201.

² Maress, Levison, loc. cit., pp. 9-24.

³ Tyson, American Text-book of Diseases of Children, p. 978.

In adults the administration of pilocarpine and the continued use of alcohol¹ increases the number of leucocytes in the blood, and a corresponding increase of the amount of uric acid excreted is found. Excessive physical and mental exertion will produce the same results. Conversely, quinine and atropine diminish the number of leucocytes in the blood, and less than the usual quantity of uric acid is passed in the urine. In healthy urine the ratio of uric acid to urea is about one to thirty in the adult; but this proportion is subject to frequent and marked variations, which may be temporary or permanent. Internal nutrition is a process of oxidation; the exact chemical changes which are effected are not clearly understood. Bence Jones² positively advanced the theory that all albuminoids in the blood are converted into uric acid, and when oxidation is complete are finally eliminated as urea, carbonic acid gas, and water; and that when an excess of uric acid appeared in the urine it was due to suboxidation, and that it indicated an incomplete chemical change of uric acid into neutral urea. It is now claimed,³ as the result of the investigations previously cited, that the relation of uric acid to urea is less close and less simple. Uric acid is regarded as the resultant of tissue metamorphosis. Urea is derived from the ingested food, and the quantity of urea in the urine is influenced by the nature of the nourishment taken. The temporary increase of uric acid following eating is therefore due to a digestive leucocytosis. The use of either carbohydrates or nitrogenous food causes scarcely any fluctuation in the amount of uric acid excreted, while the urea can be doubled by a meal of albuminoids.

While there exists much variance regarding the chemical origin and relationship of uric acid and urea, there is but little lack of harmony concerning the evil results of their excess in the blood, whether that excess be due to an over-production or a faulty elimination.

It has been claimed by Fetz and Ritter⁴ that urea is not the fatal poison in uræmia. They injected urea into the vessels of animals without producing fatal toxæmia, but Gréhant and Quinquaud⁵ later caused uræmic convulsions and death in rabbits and dogs by injecting, subcutaneously, urea in an amount equal to $\frac{1}{200}$ of the body-weight. That other poisonous waste products are excreted is proved by the fact that more acute and fatal results can be obtained by injecting into the blood uræmic urine than by using an equivalent of pure urea. Ptomaines have also been credited with the causation of the toxic symptoms. They exist in healthy blood and are decidedly multiplied in numbers during disease. That ptomaines and other toxins of unknown composition are augmented in disease is undeniable.

¹ Levison, loc. cit., p. 36.

² Bence Jones, *Journal of the Chemical Society*, 1862, p. 212.

³ Levison, loc. cit., p. 24.

⁴ Feltz and Ritter, quoted by D. J. Hamilton, *Text-Book of Pathology*, vol. i. p. 548.

⁵ Gréhant and Quinquaud, reported by Hamilton, loc. cit.

That they play no slight or harmless part in the economy, when retained, is very probable. But it would seem wisest, in the absence of definite information concerning their history, to consider most carefully as etiological factors urea and the uric acid groups, for about them we have some definite knowledge, and they, therefore, offer the best opportunities for logical clinical explanations and successful treatment.

That production of uric acid and urea in excess of normal occurs is most evident. Unless the excess be long continued or too great for excretion, it results in no harm. It is also true that normal production associated with perfect elimination will effect injury. Any insufficient removal of these excrementitious products by the natural channel, the kidneys, is therefore the condition indicative of danger.

The general consideration of this diathesis is passed with a full appreciation of the inadequacy of my effort to offer for your discussion those theories of the source of the uric acid group, and the causes of its presence in the system in excess of normal.

That impairment of the function of every vital tissue may result from this excess is obvious, yet like other dyscrasias it has localized areas of special selection for its clinical manifestations. The upper respiratory tract is chosen for closer investigation, not because the most serious effects are found there, but from the fact that this sensitive and susceptible tract gives early and persistent symptoms of the existence of the constitutional defect, and also because the dependence of these symptoms upon the general health is not sufficiently emphasized.

In its function as an organ of excretion, the kidneys are supplemented by the skin and mucous membrane. Assuming the normal specific gravity of the urine to be 1020, Tweedy¹ asserts that in health, during free action of the skin, the specific gravity of the urine may ascend to 1030. Normally urea is found among the products eliminated by the skin, and when the skin and mucous membrane are acting vicariously, we find excreted uric acid and its urates, the proteids, dextrose, cystine, and other solids. Their activity may be said, therefore, to alternate with the working of the kidneys.

In this regard the mucous membrane may be fairly considered as the internal skin, possessing as it does the functions of both secretion and excretion; maintaining also, so far as possible, its share of the balance of elimination as a relief to defective kidneys.

Undoubtedly the entire mucous lining of the alimentary canal and respiratory tract assumes the rôle of adjuvant to nephritic activity. Of this whole mucous surface the *locus minoris resistentiæ* may most frequently be found in the nose. I venture to say that no part of the human anatomy is so often the site of minor acute inflammatory affections as is the upper respiratory tract. When of its lining is required the burden of continuous excretion of toxic substances for long periods, the sequelæ are

¹ Tweedy, Medical News, vol. lxviii., No. 7, p. 178.

in order: dilatation of the arterial capillaries, followed by a similar enlargement of the veins; congestion, transudation, an inflammation tending to chronicity and abnormal glandular activity.

The histology of the nose favors such a result. The most important and active physiological structures there in relation to respiration are the turbinated bodies. These occupy much of the space of the nasal chambers. In the classical work of Zuckerkandl,¹ the mucous membrane covering the turbinated bones is described as consisting of an outer layer of connective tissue coated with flat epithelium and a deep periosteal layer; between them lymph structures containing abundant venous plexuses. Penetrating these are lymph and tubular mucous glands, the latter of great length and number, extending from the free to the periosteal surface. McCoy² says these "plexuses of blood-vessels are out of all proportion in number and size to those ordinarily found in mucous membrane." The blood contained is venous blood; the mucous glands are surrounded and bathed by it. When, in addition, that venous blood is charged with toxic material, must it not of a certainty affect the secreting glands, causing first an increased flow of mucus and then an abnormal discharge, laden with inflammatory products and excrementitious matter, and thus eventuate in a chronic nasal catarrh?

Mulford³ has recently stated, rather boldly, I think: "I believe that chronic nasal catarrh has its origin because of a diathesis; that the catarrh is an expression of such a diathesis, and would not assume a chronic course if the diathesis were not present." I am not prepared to indorse so sweeping a claim. I know that chronic nasal catarrh is at times due to a purely local irritation, but I also believe that the irritant is more often not a defective septum, but a defective blood-supply, and that the obstinacy of many cases of catarrh of the upper respiratory tract can be explained by the fact that they are simply the local expression of a constitutional ailment. Imperfect cell-nutrition resulting in perversion of function is a factor in the etiology of chronic catarrh, which I believe warrants careful study.

With less baneful effects the mucous membrane of the pharynx responds to the diathesis; less baneful, probably, because of the difference of the blood-supply. Its appearance is well pictured by Harrison Allen⁴: "The mucous membrane is of a uniform red color, the secretions are abundant, and the tonsils are tumid. Pain is not usually severe, and is referred to the pharynx and not to the muscles at the side. In true lithæmia gouty history is absent." Symptoms in other parts of the body, occasionally associated, are headache, lassitude, flatulence, loss of appetite, malnutrition of the skin, causing dryness, roughness, and itching, irritability of temper or hebetude. These conditions are generally most pronounced in the morn-

¹ Zuckerkandl, Wiener medicinische Wochenschrift, 1884, vol. xxxiv., No. 38.

² McCoy, System of Diseases of Ear, Nose, and Throat, vol. i. p. 566.

³ Mulford, American Medical and Surgical Bulletin, March 7, 1896, p. 313.

⁴ Harrison Allen, Medical News, June 16, 1888.

ing. This is explained by Bishop¹ as due to the blood being most alkaline during the early hours, consequently it then holds in solution a large quantity of uric acid. The alkalinity grows less during the active portion of the day and reaches its minimum at midnight.

These conditions may prevail during any period of adult life; those cases which most impressed me were found in young adults. These subjects may, in later years, become victims of gout or rheumatic gout. In these latter diseases the local evidences are much exaggerated and are well recognized. They have been ably discussed by Harrison Allen, F. Whitehall Hinkel,² and Duckworth. Many cases, however, do not advance beyond the lithæmic stage and give no subsequent history of gout or rheumatism. In any event it is absolutely necessary to make a thorough, general examination, for, as Beverley Robinson³ states, "It is extremely difficult to recognize in the appearance of the pharyngeal or laryngeal inflammation the nature of the diathesis which occasioned them." Much confusion exists in the literature on these subjects, from the careless interchanging of the terms gouty, rheumatic, and lithæmic in referring to diatheses. They are separate constitutional conditions, but the error is probably due to the important part taken by the uric acid group in all their history.

I request that this paper be received, not as a complete consideration of the subject, but as a preliminary study. I have purposely omitted, therefore, the questions of prognosis and treatment, and limited myself to the endeavor to show the possible relationship of the uric acid diathesis to that ailment so trying to patient and physician, catarrh of the upper respiratory tract.

¹ S. S. Bishop, Manual of the United States Hay Fever Association, 1893, p. 25.

² F. W. Hinkel, Transactions American Laryngological Association, 1889, p. 124.

³ Beverley Robinson, New York Medical Record, December 6, 1890.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

Alcoholism in Children. (*Wratsch*, No. 15, 1896.) By M. Goriatchkine.

The author has made a very interesting report on this subject to the Moscow Society of Pædiatrics. He has seen quite a number of cases of ethylism, not only among the poor and working classes, where, unhappily, the example is often set by the father of the family or by the fellow-workers, but also in families belonging to the higher classes.

The author cites, as an example, the history of a little girl of five years, who often partook of cognac, of malaga, and of port wines. This use of spirits began when she was two years of age, on the advice of a physician who was treating her. By little and little the child has become accustomed to this treatment, and actually she takes two small glasses of port and a teaspoonful of cognac each day. The child is anæmic, has restless sleep with nocturnal terrors, and the liver and the spleen are hypertrophied. In other cases the intoxication was more manifest, and showed the ordinary signs of chronic alcoholism.

In order to estimate the frequency of alcoholism in children and the causes which explain it, M. Goriatchkine has questioned the parents of all the children that he has had occasion to see in consultation at Saint Olga's Hospital. In four months he has been able to collect information of one thousand six hundred and seventy-one children (eight hundred and forty-one boys and eight hundred and thirty girls) from one to twelve years of age; of this number five hundred and six children (two hundred and eighty-two boys and two hundred and twenty-four girls),—that is to say, about one-third,—take alcohol, either as a result of their environment or (in half the cases) upon the advice of a physician. This abuse often commences in the first year. The author is convinced that, if there are so many alcoholics among the children, it is in a great degree the fault of physicians who habitually prescribe the various forms of alcohol either to stimulate the

appetite or for other objects. Children thus frequently receive different preparations (vermifuges, diarrhoea remedies, etc.) in alcoholic infusion.

However, in the great majority of cases, alcohol is not indispensable, and ought to be replaced by other substances. In all cases except acute pyrexias, the utility of alcohol is far from demonstrated. In prescribing alcohol, the habit may be formed, the need of an excitant may be felt, and in predisposed children, the issue of alcoholic parents, the alcoholic diathesis created by the alcoholism of the parents and remaining until that time in a latent state may often be awakened.

The only cases in which alcohol should be given, according to M. Goriatchkine, are those of the acute diseases with heart-failure; but even here alcohol should not be prescribed hastily, but should be put off as long as possible, and employed only as a last resort. When the cardiac activity has returned to the normal the remedy should be discontinued.

The administration of alcohol in chronic troubles of nutrition, to "give strength" to the child, appears to be not only useless but even dangerous, on account of the need which it creates. On the other hand, there is no known authentic case in which alcohol shall have rendered real service. The fact that for the past six years alcohol has been used only in cases of extreme urgency at Saint Olga's Hospital (Moscow) is a proof of the manner in which one may omit it in medicine. The results have been far from less beneficial than formerly.

Therefore, the author advises strongly, in accord with Strümpell and Smith, to avoid prescribing alcohol as much as possible, and to oppose the parents with all one's power if they try to make children take it under whatever pretext.—*Gazette des Hôpitaux*, August 11, 1896.

Concerning the Occurrence of Thyreoidine in the Human Body. (*Wiener klinische Wochenschrift*, July 16, 1896.) By Jul. Schnitzler, M.D., and Karl Ewald, M.D.

A number of pituitary bodies, weighing altogether nine grammes, were collected in the pathological department and carefully analyzed for the presence of iodine, which was found to be present in noticeable quantities. As this result was directly contrary to that of Professor E. Baumann, a second investigation was made upon a collection weighing altogether twenty-four grammes, with similar results, and the authors conclude that the determination of the presence of iodine in the pituitary body is an advance in our knowledge of the vicarious action of this gland for the thyroid. Ewald alone made some analyses to determine the presence of iodine in the thyroid gland in various morbid conditions. In four cases of thyroid carcinoma relatively considerable iodine was present, and it was also found in the metastatic masses. In a tumor of which a large portion had undergone hyaline degeneration, no iodine was found in the degenerated mass, and but traces in the surrounding tissue, and Ewald concludes that colloid degeneration may make the gland to a certain degree incapable of perform-

ing its function. In a gland with advanced colloid degeneration and a greatly diminished parenchyma only slight traces of iodine were present. In a similar case, in which, however, the parenchyma was well preserved, a very marked iodine reaction occurred. In a third case that showed advanced parenchymatous degeneration no iodine was present. [It seems indicated by these investigations that the presence of iodine is associated in some way with the functional activity of the parenchyma, and the fact that the carcinoma cells appear to be able also to secrete it, perhaps explains the rarity of myxœdematous symptoms in this condition.]

A Contribution to the Casuistry of Treatment with Carcinoma-Serum. (*Wiener klinische Wochenschrift*, July 16, 1896.) By Josef Sartschneider, M.D.

Six cases in all were treated by the serum of Scholl and Emmerich. Of these three were carcinoma of the breast, all of which showed progressive increase of the primary tumor and its metastases ending in death; one was a case of epithelioma of the lips, in which all the symptoms grew worse, but the final result was not determined, one was sarcoma of the leg, death occurring shortly after admission, and the sixth a lympho-sarcoma of the neck. In the latter alone there was a notable reduction in the size of the growth and improvement in all the symptoms, but the patient unfortunately passed from observation. The injections were very painful in nearly every instance, and, in a case of mammary scirrhus, exceedingly difficult. Following the treatment there was usually febrile reaction, and the site of the injection continued painful for some hours. Often the patient complained of nervousness and irritability for about twenty-four hours. The local changes were softening of the tumor and the development of an area of redness for some distance in the surrounding skin, in which the vessels appeared distinctly injected. In time this region became œdematous, but in no case was pus found upon incision. Sartschneider concludes that, although the serum has a pronounced effect upon carcinoma, it is very doubtful if this effect is of a curative nature, as in every case not only did the primary tumor increase in size, but the metastases became rapidly more widely extended, especially in the red-dened and œdematous skin around the site of the injection, and the reaction by its severity often caused a state of dangerous depression. In regard to lympho-sarcoma, the results are possibly more favorable, although it is hardly possible to draw conclusions from a single case, particularly as the observation was not complete.

A Case of Pulmonary Tuberculosis treated by Serotherapy. (*Comptes Rendus de la Société de Biologie*, July 3, 1896.) By Dr. de la Jarrige.

The patient, a girl of twenty-one, had enjoyed excellent health until she reached the age of seventeen, when she began to suffer from a dry

cough, and a tubercular infiltration of the left apex was recognized. The symptoms grew progressively worse until at the time of commencing the treatment there were the signs of numerous cavities in the left lung and a tubercular laryngitis. Massive intrapulmonary injections were practised, with the result of greatly diminishing the catarrhal symptoms, but, as these subsequently reappeared and the condition of the patient became desperate, it was decided to employ subcutaneous injections of the antitubercular serum of Richet and Héricourt. The first and second injections were without effect, but the third was followed by an intense urticaria, accompanied by severe headache and delirium, the temperature reached 40° C. (104° F.), and there was profound prostration. Death was expected, but improvement took place and continued until the patient was at least as well as before the injection. After a second series of injections another reaction occurred, less violent in character, and improvement continued until the health of the patient was completely restored, although there were still signs of a dry cavity in the left lung. Jarrige concludes that we are now in a position to combat tuberculosis successfully by the employment of intrapulmonary injections, antitubercular serum, and forced feeding. The serum used was obtained from a dog immunized by avian tuberculosis.

The Effect of Ligature of the Lymphatics of the Liver upon the Anticoagulant Action of Propeptone. (*Comptes Rendus hebdomadaire de la Société de Biologie*, July 3, 1896.) By E. Gley, M.D.

Although certain experiments that the author had made in collaboration with Pachon had demonstrated that the operation of ligating the lymphatics apparently prevented the coagulating action of propeptone upon the blood, certain doubts that had been expressed concerning the accuracy of their observation induced them to repeat the experiments upon a series of twelve dogs; in six of these the technique was successful and the result invariably as before, the clot forming promptly after the injection of the propeptone. As a possible explanation of this phenomenon Gley suggests that the intraparenchymatous pressure in the hepatic cell is greatly increased by the congestion of the lymph, and that, in consequence, the cell itself resists more or less than in the normal condition.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

Anticholeraic Inoculations at Calcutta. (*Indian Medico-Chirurgical Review*, July, 1896.)

Dr. Simpson, the health officer of Calcutta, presents a very complete report of the results of the anticholeraic inoculations performed in Calcutta during the past two years.

The number of people inoculated during this period was seven thousand six hundred and ninety; of these five thousand eight hundred and fifty-three are Hindoos, one thousand four hundred and seventy-six Mohammedans, and three hundred and sixty-one other classes. A careful system of registration of data regarding each person inoculated is used, so that investigations concerning the effect of the inoculations can be readily made. These investigations are confined exclusively to those houses in which cholera has actually occurred, the object being to ascertain and compare the incidence of cholera on the inoculated and uninoculated in those houses in which inoculations have been previously carried out. For this purpose infected houses in which inoculations have not been performed and inoculated houses in which cholera has not appeared are excluded, as they do not furnish a reliable basis for comparison. The accuracy of these observations has been confirmed by special investigation on two occasions, one in July, 1895, when M. Haffkine revisited ten of the thirty-six houses in which inoculations had then been made, and the other quite recently, when Surgeon-Captain Robson Scott, J.M.S., deputy sanitary commissioner of the Presidency Circle, spent several weeks in testing the accuracy of the recorded observations.

The data collected have been grouped under three periods, and show the following results: 1. In the houses where cholera occurred during the first four days after the inoculation—a period in which the protective influence of the vaccine is gradually asserting itself—there were one hundred and sixty-seven uninoculated individuals, who had six deaths (3.59 per cent.) and three attacks ending in recovery, and two hundred and fifty-nine inoculated persons, who had five deaths (1.93 per cent.) and one attack with recovery. 2. In the houses where cholera occurred during the year following the first four days after the inoculation and in which there was almost absolute freedom from the disease among the inoculated, there lived five hundred and two non-inoculated, who had forty-two deaths (8.37 per cent.) and five attacks ending in recovery, and two hundred and sixty-nine inoculated who had one death (0.37 per cent.). 3. In the houses where the disease appeared more than one year after inoculation, where there was a gradual disappear-

ance of resistance against the disease, there were two hundred and thirty-eight uninoculated, who had twenty-three deaths (9.66 per cent.) and three attacks with recovery, and ninety-six inoculated who had six deaths (6.5 per cent.). Taken collectively, among six hundred and fifty-four uninoculated persons there were seventy-one deaths, while among the four hundred and two inoculated individuals in the same households there were twelve deaths, a reduction of mortality of 72.47 per cent.

The results in Calcutta are fully confirmed by reports from other parts of India, which are also given in detail in this article.

This evidence of the protective nature of these inoculations incites the writer to urge upon the commissioners the importance of adding to their defensive weapons against cholera the powerful one of inoculation.

Therapeutics, New and Old. (*Medico-Chirurgical Journal*, July, 1896.) By William Carter, M.D.

By old therapeutics the writer does not mean those of a period when our national pharmacopœias were encumbered with such so-called "remedies" as "secundina humana," etc. He refers to the century or century and a half immediately antecedent to our own time, when a new spirit had grown up and originated a new method for establishing the utility of drugs. Physicians then began to try drugs on those who were diseased, and admitted or rejected them accordingly as they stood the test. The trial of the merits of a new remedy was generally one of years, and when its final recognition came there was not a medical man in the kingdom who did not feel that he was justified in confidently relying upon its efficacy. Nearly all of the great practical remedies of that time remain to this day as highly valued as they were nearly a century ago. The practical sagacity of keenly observant men, who watched the effects of agents on patients actually suffering from various diseases, was not likely to be deceived in the final judgment of their utility.

Was this old method a sound one? Did it deserve the appellation "scientific," or should it be despised and discarded as empirical, in the modern and unworthy sense of that term? In order to deal fairly with the question it must be remembered that more precision was given to this system of applied therapeutics by using it in connection with a broad but approximately accurate classification of human beings into distinct physiological groups. Men were classed as nervous, sanguineous, lymphatic, bilious, etc., and what would suit the lively, hopeful patient was believed unsuitable for the lymphatic or bilious one. These systems were correlatives of each other; for it had not then occurred to men of science that it would be much nearer the truth to discard all of the finer sensibilities of the spirit—if, indeed, the refined modern experimenter is willing to admit that there can be anything worthy of that name outside of what can be seen by his microscope, or that cannot be weighed in balances to which $\frac{1}{1000}$ gramme is a heavy weight, or that cannot be penetrated and made visible by electrical

rays—and to consider all living tissues in their relation to medicines in terms of so many grammes of guinea-pig, dog, or rabbit on which they had been experimentally made to act in the pharmacological laboratory.

Even the vast changes in practice which have taken place within the past one hundred or one hundred and fifty years are due to the cautious but fearless spirit of independent observation. If we consider for a moment the disuse of venesection we shall be convinced of this. Almost all the so-called scientific demonstrations of the reasons why indiscriminate venesection *ought* to be bad have been given to us long since the time when, the independent spirit of observation of our predecessors having proved it to *be* bad, it was omitted from practice.

Perhaps nothing has served so strikingly to manifest the contrast between the old and new methods of laying a foundation for therapeutics as the discussions recently carried on in the *British Medical Journal*, and of all the papers that of Professor Cash may be taken as best exemplifying the spirit of the new one. In it he says that "it is neither conducive to the accuracy of pharmacological research, nor yet of treatment, that we should work with bodies whose constitution is not understood, and which may contain principles divergent or even antagonistic in their action."

Is it then so unscientific as Dr. Cash's statement would imply to use bodies whose constitution is not understood, and to associate together in the same prescription drugs which are physiologically antagonistic to each other?

Let those practical therapeutists give the answer who know the uses of opium, of digitalis, of jaborandi, and of their advantages in hundreds of cases over morphine, digitaline, pilocarpine, etc.

Then, as to accuracy of treatment, and impossibility of attaining to it unless the constitution of the bodies with which we work is completely understood, did it detract from the accuracy of treatment of myriads of malarial-stricken patients that they should have been completely cured by the employment of cinchona bark before the composition of that wonderful drug was made known? Ipecacuanha cured dysentery quite as well before its alkaloid (emetine) was discovered as ever it has since.

The therapeutics of a hundred years ago were at least practical, but we have learned much in our time. We have learned or are learning the great potency and how precisely to control the influence of animal ferments in their maintenance of a healthy balance between the various tissues; we have learned or are learning how, by means of antitoxins, some of the most malignant of the infectious diseases can be brought under control by the application of principles akin to those which were first applied by that noblest of noble Englishmen, the anniversary of whose great discovery we celebrate this year; we have learned or are learning the great influence of antiseptics on disease.

The future is full of promise. For all the great work that lies before us, a wise combination of sagacious and patient observation of disease and

the remedies which influence it, on the one hand, and of cautiously-conducted laboratory experiments, on the other, is essential. Neither method can afford to despise the other; but each in a spirit of humble and reverential desire for truth concerning this great mystery of human life in all its manifold phases should go hand in hand with the other, each assisting the other in its great aim of elucidating the mysteries of disease, and of relieving human suffering.

The Therapeutic Value of the mixed Toxins of the Streptococcus of Erysipelas and Bacillus Prodigiosus in the Treatment of Inoperable Malignant Tumors. (*American Journal of the Medical Sciences*, September, 1896.) By William B. Coley, M.D.

In this interesting article the writer discusses the different methods that he used in the preparation of the toxins of the erysipelas streptococcus and the bacillus prodigiosus; the mode of their administration, and their therapeutic value in the treatment of tumors.

In the method finally determined upon as of the greatest value in the preparation of these toxins, the two germs are inoculated together into the same broth, the erysipelas streptococcus being first grown alone for ten days, the prodigiosus bacillus then added, and the two allowed to grow together for ten days. The cultures are sterilized by keeping them at a temperature of 58° to 60° C. for one hour, and are then used without filtration.

Cultures recently obtained from fatal cases of erysipelas were found to give the most virulent toxins. Mr. Burton, director of the Loomis Laboratory, from whom the writer received much assistance, prepares these mixed toxins powerful enough to produce very severe constitutional symptoms with a prolonged chill and a temperature of $104\frac{1}{2}^{\circ}$ in doses of one-half a minim (0.066 cubic centimetre).

An important point to remember in regard to dosage is that much larger quantities can be borne when injected subcutaneously than when injected into a vascular tumor where absorption is much more rapid. One minim of a filtrate or one-half a minim of the unfiltered toxins is the initial dose, and this is gradually increased each day until the reaction-temperature reaches 103° to 104° F. Very little benefit has been noted in cases in which no reaction was obtained. Daily injections aiming to get two or three well-marked reactions during a week are continued for two or three weeks, and then discontinued if no decided improvement has taken place. In some of the successful cases, however, the treatment has been kept up for three or four months, occasional intervals of a few days rest having been allowed.

A report of one hundred and sixty cases gives many striking instances of improvement and of disappearance of these tumors. The writer says, "This series of upward of twenty cases of inoperable sarcoma, four of which have remained well for more than two and a half years, the diagno-

sis in all of which has been established beyond question, according to the accepted methods of diagnosis, I believe to be sufficient to demonstrate that a real and positive step forward has been made in a field that, up to the present, has resisted every attempted advance of medical science."

Conclusions : 1. The mixed toxins of erysipelas and bacillus prodigiosus exercise an antagonistic and specific influence upon malignant tumors, which influence in a certain proportion of cases may be curative. 2. This influence is slight in most cases of carcinoma (including epithelioma); most marked in sarcoma, but varies with the different types, the spindle-celled form showing by far the greatest influence. 3. The action of the toxins is not merely local in character, but systemic. 4. The toxins should be used only in clearly inoperable cases, or after primary operation to prevent recurrence. 5. The results will vary greatly with the strength of the preparation, the most virulent cultures giving the best results.

The Influence of Acute Alcoholism on the Normal Vital Resistance of Rabbits to Infection. (*The Journal of Experimental Medicine*, vol. i., No. 3, 1896.) By A. C. Abbott, M.D.

The question of the effect of alcohol when used as a beverage, which is now being investigated by the committee of fifty, is in this article confined to its influence upon the normal vital resistance of animals exposed to various forms of infection. The pyogenic cocci, i.e., the *streptococcus pyogenes* and the *staphylococcus pyogenes aureus*, and the *bacillus coli communis*, have been thus far the infectious organisms with which the experiments have been conducted. Cultures of these germs were inoculated into groups of alcoholized and non-alcoholized animals, so that, by a comparison of results, the difference could reasonably be referred to a reduction of vital resistance brought about by the alcohol administered.

The alcoholized rabbits were kept daily in a state of intoxication. The dose necessary to positively produce intoxication ranged from five cubic centimetres to fifteen cubic centimetres of pure ethyl alcohol.

From the results of these experiments the author concludes : That the normal vital resistance of rabbits to infection by *streptococcus pyogenes* is markedly diminished through the influence of alcohol when given daily to the stage of acute intoxication. That a similar, though by no means so conspicuous, diminution of resistance to infection and intoxication by the *bacillus coli communis* also occurs in rabbits subjected to the same influences. And that, while among the alcoholized rabbits inoculated in various ways with *staphylococcus pyogenes aureus*, individual instances of lowered resistance are observed, still it is impossible to say from these experiments that in general a marked difference is noticed between alcoholized and non-alcoholized animals as regards infection by this particular organism. It is interesting to note that the results of inoculation of alcoholized rabbits with the erysipelas coccus correspond in a way with clinical observation on human

beings addicted to the excessive use of alcohol when infected by this organism.

Throughout these experiments, with few exceptions, it will be seen that the alcoholized animals not only showed the effects of the inoculations earlier than did the non-alcoholized rabbits, but in the case of the streptococcus inoculations the lesions produced (formation of miliary abscesses) were much more pronounced than are those that usually follow inoculation with this organism.

Gelanthum. (*Therapeutische Wochenschrift*, September 13, 1896.) By P. G. Unna, M.D.

After two years' experience with this vehicle the writer recommends it very strongly for use in the various skin-diseases.

The great difficulty with the soluble varnishes used heretofore has been that insoluble substances like zinc oxide, sulphur, and chrysarobin cannot be evenly suspended in them, but collect in lumps or fall to the bottom, but in gelanthum they are evenly divided and remain suspended. Hygroscopic substances like ichthyol easily form a dry coating in this vehicle, and large quantities of the necessary medicaments can be added, as of ichthyol thirty per cent., of salicylic acid, resorcin, and pyrogallol four per cent., and of carbolic acid five per cent., without destroying its varnish-like properties. Two incompatible bodies, such as salicylic acid and zinc oxide, which in watery solutions undergo chemical reaction, can be used together in gelanthum. Fats can be mixed with it to the amount of ten per cent., and glycerin twenty per cent., to prevent its drying too quickly.

Gelanthum—named from its principal constituents—consists of equal parts of gelatin and tragacanth. Each substance is macerated slowly in cold water, then subjected to steam and filtered. By this means the gelatin is deprived of a part of its gelatinous property. The two substances are then mixed and subjected to steam for two days, and then pressed through gauze. Glycerin five per cent., some rose-water, and two per cent. of thymol are added. The medicament to be added, if not soluble in water, must be rubbed into a soft paste with water, and fats must first be emulsified by gums and water.

As compared with the old soluble varnishes it presents the following advantages: it spreads easier, dries more quickly, and with a smoother surface; it holds the solid substances evenly suspended and finely divided upon the skin; it tolerates all substances singly and together; hygroscopic substances are made to dry; it bears an addition of fat to prevent drying too quickly. It is a cheap vehicle.

Maragliano's Antitoxin-Serum; Treatment of Pulmonary Consumption.—The *New York Medical Journal*, of August 15, 1896, in an editorial, reviews an article on the serum treatment of pulmonary tuberculosis, by Dr. Zaeslein, of Genoa. The writer thinks that the use of the

serum prepared by Maragliano has passed the experimental stage, and may safely be received into practical therapeutics, for the dose, in antitoxic units, is adjustable and calculated for long periods and the use of the remedy rests on adequate clinical observation.

Maragliano inoculates the animals from which the serum is to be obtained—dogs, asses, and horses are employed—with a mixture of filtrates from cultures that have been heated and from those that have not been heated. The heated cultures are prepared by steaming highly virulent cultures at a temperature of 212° F. for three or four days, and then treating them in the same way as for producing Koch's tuberculin. The unheated cultures are filtered through a Chamberland filter, and then placed in a vacuum with the temperature never above 86° F. The first product contains all the toxic elements that resist heat,—i.e., the bacterial proteins or tuberculins; in the second there are the toxalbumins, which do not bear heat, and tuberculins also. To establish an unchanging toxic unit each filtrate is concentrated to such a degree that a cubic centimetre will contain a hundred toxic units,—i.e., a cubic centimetre for each fifteen hundred grains of the guinea-pig's weight will be required to kill an animal. Three parts of the heated and one part of the unheated filtrate are used for each inoculation, the operator beginning with two milligrammes for each kilogramme of the animal's weight, and increasing the dose one milligramme daily until it reaches from forty to fifty milligrammes. The inoculations are usually continued for six months. Three or four weeks after the last inoculation blood is drawn from the animal and the serum is separated and treated according to the ordinary method.

The effects of the treatment on the manifestations of the disease are: diminution and final disappearance of the râles from drying up of the deposits. The areas of dulness diminish or disappear. Slight fever usually disappears; high fever may abate and even subside entirely. There is gain in weight even if the fever continues. The tubercle bacilli in the sputa become reduced in number and finally disappear entirely. After further treatment the appetite improves, the patient sleeps well and can exercise without fatigue.

Maragliano's statistics relate to four hundred and forty-five cases which are divided into six groups. A summary of the results obtained from the treatment shows that the fever disappeared in one hundred and seventy-six out of three hundred and twenty-two cases,—in fifty-five per cent. of cases of broncho-pneumonia with "microbian associations;" in thirty-two per cent. of those of cavities; in forty-eight per cent. of those of diffuse broncho-pneumonia; and in eighty-six per cent. of those of circumscribed broncho-pneumonia. The local signs disappeared in twenty-seven per cent., were improved in forty-one per cent., were unchanged in thirty per cent., and were aggravated in six per cent. There was an increase of weight in fifty-seven per cent. The tubercle bacilli disappeared in forty-three and two-tenths per cent.

The serum was administered subcutaneously every other day and the temperature carefully observed. When a rise occurred, the treatment was suspended until it fell. When this treatment failed to affect patients who had high fever, from five to ten cubic centimetres of the serum were given every fifth day.

The use of the serum should be continued until a cure results, then two injections a week should be given for two months, and after that one injection a week for a year. The side of the chest and back are the preferable parts of the injection.

[At the late French Medical Congress the question of the value of the serum diagnosis of typhoid fever was discussed. M. Achard has obtained the characteristic reaction with the milk and blood of a typhoid patient. M. Widal has observed agglutination of the bacilli by the serous fluid removed from a blister of a typhoid patient with lung complications. He also obtained characteristic results with the serum of two persons who had had severe attacks of typhoid fever three and five years previously.—*British Medical Journal*, August 29, 1896.]

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
New York City,

WM. G. SPILLER, M.D.,
Philadelphia.

Hysterical Trophic Lesions of the Teeth. (Report of the Third French Congress for Internal Medicine; *Semaine Médicale*, August 9, 1896.) By Dr. Sollier.

Erosion of the enamel of the teeth with exposure and destruction of the dentine was observed in two patients who had had hysterical anorexia with vomiting. The exposed nerves were very painful. The roots were not involved for a long time. The lesions were believed to be due to hysteria.

The Family Form of Spastic Paraplegia. (Report of the French Congress of Alienists and Neurologists; *Semaine Médicale*, August 8, 1896.) By Drs. Raymond and Souques.

The spastic paralysis began in one sister at the age of nine years in the right lower limb, and later involved the left as well as the trunk and upper extremities. The contractures are now extreme in the lower limbs. In the trunk and arms the movements though possible are stiff.

In the other sister the spastic paralysis began, at the age of twelve, in the left lower extremity and extended to the right. The trunk and arms are not yet involved.

In both the patella reflex is exaggerated. There is only one autopsy on record of this form of disease, and that was reported by Strümpell. In his case there was combined sclerosis involving the pyramidal tracts, the columns of Goll, and the direct cerebellar tracts.

Dr. Etienne, in the same congress, reported a case of facial monoplegia with conjugate deviation of the head and eyes. At the autopsy the anterior part of the internal capsule was found destroyed by a hemorrhage.

Paralysis and Muscular Atrophy following Injection of the Sterilized Culture of the Pneumococcus. (*Comptes Rendus des Séances de la Société de Biologie*, July 25, 1896.) By Paul Remlinger, M.D.

Symmetrical atrophy of the anterior limbs began to develop in a rabbit twelve to fifteen days after the injection of a sterilized culture of the pneumococcus.

Eight days later the atrophy was intense. During this time fever, loss of appetite, and torpor were noticed. Myelitis was probably the cause, although the diagnosis was not confirmed by autopsy, as the animal still lives.

An Acute Case of Total External Ophthalmoplegia and Laryngeal Paralysis, resulting from Peripheral Neuritis in the Early Stages of Tabes. (*Comptes Rendus des Séances de la Société de Biologie*, July 25, 1896.) By Drs. Dejerine and Petreen.

Complete external ophthalmoplegia on the right side, and nearly complete on the left, developed in the preataxic period of tabes. The pupils responded slowly and imperfectly to accommodation and light. On account of paresis of the dilators of the glottis the patient was in a permanent state of dyspnoea, and died from suffocation.

At the autopsy the diagnosis of tabes was confirmed. The third, sixth, tenth, and eleventh nerves of both sides were much atrophied, and presented the lesions of acute parenchymatous neuritis in the extramedullary portion only of the nerves. The explanation for this is not readily found. The nerve cells were intact (the method of Nissl could not be employed).

The case is interesting on account of the rapid course of the external ophthalmoplegia and laryngeal paralysis in a case of tabes, as usually the development is slower; and also on account of neuritis as the cause of these affections.

Scleroderma. (*Journal of Nervous and Mental Disease*, July, 1896.) By F. X. Dercum, M.D.

In diffuse scleroderma two or even three stages may be distinguished, this is probably also true for the circumscribed and more purely localized forms. In the diffuse variety a condition is early noted in which the substance of the derma, and it may be of other structures, is increased in both volume and density. According to the physical qualities of this

enlargement the cases may be separated into the indurated and the oedematous forms. A third variety may be recognized in which the volume of the skin is not so much affected as its density and resistance. Three cases of this uncommon disease are reported.

The first case was a patient who received a severe transverse lacerated wound over the occiput, and the disease is to be attributed to the nervous shock produced in this way. The wound healed rapidly and there was nothing to suggest an infectious origin. Persistent asthenia and mental depression were noted. Some months after the accident considerable swelling was observed over the shoulders and arms, and to a less extent over the forearms, chest, abdomen, and back. There had been persistent headache. The patient first noticed that the skin on the back of the neck and about the scar was stiff and hard. This stiffness gradually extended to the face, shoulders, arms, and trunk. There were no sensory disturbances. The knee-jerks were plus. An examination of the blood showed an excess of leucocytes, especially of the mononuclear. Peptone, or albumose, was found in the blood but not in the urine. Pigmentation of the skin was noted later in the process. The patient perspired freely, the extremities were often cold, and he was very irritable.

The disease in the second case began in swelling of the hands, and black specks appeared on the finger-tips, later the fingers became very sensitive. The feet and ankles were observed to be swollen in the morning. The patient was very weak. Pain was experienced especially in the elbows, wrists, and knees, and a sense of stiffness was felt in the neck. When examined by Dr. Dercum, more than a year after the beginning of the disease, the patient was much emaciated, owing to the disappearance of the superficial fat, the tissues of the face were slightly resistant to the finger, pigmentation of the skin of the abdomen and trunk was observed. Over the back of the hands, fingers, and thumbs the skin was rigid and glossy and was thickened over the phalangeal joints. About the ankles also the skin was resistant. Passive and voluntary movements at the wrist, metacarpal and phalangeal joints were impaired. The patient was very neurasthenic. Above the left knee a swelling was observed which varied from time to time as did also the infiltration of the hands. Röntgengraphs failed to show the clear spaces in the second and third phalangeal joints normally present, and in one picture at least a shadow could be traced at the ends of the bones as though the transparent cartilage had been made opaque by the deposit of some substance not permeable to the Röntgen ray. The general condition of the patient improved under treatment. It is probable that structures other than the skin were involved in this case, for in parts where the skin was pliable movement was impaired. Ulceration at the base of the occiput and over the phalangeal joints, and ridging of the nails must be mentioned.

In the third case also the disease began by swelling of the fingers. The skin is at present tightly drawn over the forehead and nose, and there

is a decided sclerodactyle of both hands. Ankylosis is observed in the phalangeal joints.

Dr. Dercum discusses the trophic changes seen in the disease and the pathological findings. He believes that primarily the connective tissue is infiltrated, swollen or enlarged, and that there is a certain analogy between this disease and myxœdema.

The Origin of the Tabetic Amyotrophy. (*Revue neurologique*, No. 4, 1896.) By C. Schaffer, M.D.

While some (Dejerine) consider the tabetic amyotrophies as due to lesions of peripheral nerves, others (Charcot, Pierret, Leyden, and Condo-léon) believe them to be of central origin. Schaffer has examined by the method of Nissl the spinal cord from a case of advanced tabes with arthropathy of the knee. The anterior horns of the cervical cord contained normal nerve cells of the stichochromic type. The cells of the lumbar cord were very different, only a few were normal. In some the chromatic substance appeared as very small granules, in others disintegration was seen near the periphery, and the perinuclear portion was diffusely and intensely stained; under high power this was found to be due to the presence of many minute granules of chromatin in the achromatic substance. The chromatic substance of the processes was normal in most cases even when the cell body was much altered. Schaffer states that in tabetic amyotrophy—perhaps in every case—there is a peripheral neuritis, but this does not exclude a central affection, and does not mean that the peripheral alterations are independent of the affection of the anterior motor cells. The tabetic amyotrophy may have its origin in the primary affection of the nerve cells of the anterior horns. The altered trophic function of the cell is shown first at the most peripheral part of the nerve fibre and the intervening portion of the nerve may be intact. In tabes the changes in the ganglion-cells are of slow formation. Destruction of the reflex collaterals from the posterior roots cuts off much of the normal excitation of the anterior cells and structural changes take place.

Secondary Degeneration, especially of Gowers's Tract, with some Observations on the Reflexes, in Compression of the Spinal Cord. (*Archiv für Psychiatrie*, xxviii. p. 510.) By A. Hoche, M.D.

The following are the most important results obtained from an examination of the spinal cord by the method of Marchi, from a case of compression by an accumulation of pus:

The comma zones of the posterior columns were degenerated for an unusually long distance: from the seventh thoracic to the third lumbar segment, but, contrary to the opinion of Gombault and Philippe, they were not found to have any connection with the oval field of Flechsig in the lumbar cord. The degenerated fibres belonging to the oval field of the lumbar region between the seventh thoracic (the seat of compression) and the first

lumbar segment were found at the posterior periphery of the cord, and it was observed that in the higher regions they approached the posterior horns without leaving the periphery. The origin of these fibres is unknown.

Degenerated fibres were seen to pass from the columns of Goll into the restiform bodies by means of the posterior external arciform fibres; such fibres were also observed to pass to the direct cerebellar tracts, and a few into the decussation of the fillet.

In this case, for the first time in man (Hoche), the tract of Gowers has been traced to its termination. In the upper part of the pons the tract bends upon itself so that a section at this level contains two separate portions of the fibres. Degenerated fibres were found in the roof of the fourth ventricle, partly in the velum medullare anticum, partly in and near the anterior cerebellar peduncles. The termination of this tract is in the vermis. It seems that only those fibres which enter Gowers's tract from the upper and middle third of the spinal cord terminate in the cerebellum, while those from lower regions probably do not extend beyond the cervical cord.

The reflex arc in the lumbar cord was intact, yet notwithstanding the descending degeneration of the lateral pyramidal tracts, and the location of the area of compression seven segments above this arc, the patella reflex was absent during life. Likewise in a second case reported by Hoche, of compression from luxation of the seventh cervical vertebra, the patella reflex was absent. This is in accordance with the statements of Bastian.

In both cases, one of compression at the seventh thoracic, the other at the eighth cervical segment, the degeneration in the posterior columns below the lesion extended in the thoracic region along the periphery, in the lumbar region it occupied the oval field of Flechsig, in the sacral cord it formed the triangular area of Gombault and Philippe, and extended to the filum terminale.

Hoche believes that in the antero-lateral columns the longer the associative fibres are the more peripherally are they situated.

A Case of Tumor of the Cerebellum in which Operation was Rejected. (*American Journal of the Medical Sciences*, September, 1896.) By James Hendric Lloyd, A.M., M.D.

The patient reported by Dr. Lloyd had been struck on the occiput seven years ago, and since that time had had violent headaches. Five weeks before admission into the hospital he began to have severe shooting pain, situated, like the headaches, in the occipital region. Vision began to fail. Vertigo, without vomiting, except once, was complained of. On examination, in February, 1896, he was seen to have a characteristic cerebellar gait and attitude. His head and trunk were forced to the right side even when he attempted to sit up in bed; this position was very noticeable in walking. He was almost completely blind, and had dilated pupils. His speech was hesitating and cerebration was slow. The knee-jerks were ex-

aggrated and slight ankle clonus was observed. There was no anæsthesia and no paralysis of arms or legs. In the horizontal position control of the lower limbs was good. The muscles supplied by the fifth, sixth, seventh, ninth, and twelfth nerves were not paralyzed. There was no involvement of bladder or rectum. Choked disk in each eye was reported by Dr. Oliver. With the exception of slight response of the left iris to very strong light stimulus there was no reaction to light, accommodation, and convergence.

About two months after admission incontinence of urine was observed.

The diagnosis was made of tumor in or near one of the middle cerebellar peduncles. Largely on account of a deformity of the skull due to an injury, operation was decided upon, but a change in the patient's symptoms rendered this impracticable.

At the autopsy an oblong gliosarcoma, five and a half centimetres by two and a half centimetres, was found on the under surface of the cerebellum between the pons and medulla on one side and the right lobe of the cerebellum on the other. The fourth ventricle was entirely free. The tumor sprang entirely from the under and external surface of the middle cerebellar peduncle. The location of the tumor explained the high grade of optic neuritis. No satisfactory explanation was obtained from the autopsy for the ophthalmoplegia interna without ophthalmoplegia externa. It is remarkable that none of the cranial nerves, except the eighth,—as far as the patient's condition permitted tests to be applied,—were injured by the tumor. In this case the forced movement was towards the side of the lesion.

Loss of Consciousness in Hysterical Attacks. (*Revue Neurologique*, September 15, 1896.) By A. Pitres, M.D.

Dr. Pitres discusses the subject of the preservation of consciousness and memory in hysterical convulsions. There are, according to him, three periods in a complete hysterical attack.

1. The pre-convulsive period, in which the aura, mental, sensory, or ovarian, occurs.

2. The convulsive period, consisting of the tonic and the clonic spasms.

3. The post-convulsive period, of which the most striking feature is the delirium identical with the mental state which characterizes one or the other of the different varieties of hypnosis.

In the first period consciousness and memory are always preserved, and injury which might occur during the second period may be prevented by precautionary measures. Preservation of memory explains the ability of the patient to tell the hour at which the attack began.

In the second period consciousness and memory are usually abolished, and the patient has no knowledge of the convulsions.

In the third period consciousness is usually preserved. The patient replies to questions put to him, except in those cases in which he falls into

a profound lethargy or into an acute maniacal delirium. He has knowledge of his movements, and yet when the attack is terminated he is ignorant of what he has said and done during this third stage. If he is placed in a hypnotic state he is able to recall the words uttered in the post-convulsive period.

Any one of the three periods may exist alone.

Occasionally, when the second period constitutes the entire attack, the patient may be able to reply to questions, but he has no knowledge of his convulsive movements, and states during severe convulsion that he is in perfect repose.

In rare cases, when the post-convulsive period constitutes the entire attack, consciousness may be partially or totally abolished, and memory may be lost not only in the normal state succeeding, but also in the hypnotic.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children,

AND

LAWRENCE S. SMITH, A.B., M.D.,

Instructor in Clinical Gynæcology in the University of Pennsylvania.

A Contribution in Regard to the Reflex Action of Operative Traumatism upon Circulation and Respiration. (*Centralblatt für Gynäkologie*, 1896, No. 19.) By Wilh. Rühl, M.D.

The author reports two cases of post-operative shock following celiotomies in support of the theory that many cases of intense shock and subsequent death, which cannot be attributed to any tangible cause, are due to reflex action on the heart and respiratory centre produced by the irritation of the peripheral nerves. The anæsthetic lessens the intensity of these reflexes, and it is only on return to consciousness that the patient's condition becomes grave. In the case of the first patient the operation, a myomectomy, lasted only forty-five minutes, and at its conclusion the condition of the patient was most satisfactory. One hour later she was in a state of profound shock with failure of heart and respiration. All means of stimulation were tried without effect, and the situation was becoming most serious until an injection of a full dose of morphine was tried. The result was most surprising: in a few minutes the pulse became perceptible again and slowly regained its normal strength and rhythm. A relapse, four hours later, required another dose of morphine, but after that the recovery was uninterrupted.

The second case was a more difficult operation,—a hysterectomy. This required one hour and a quarter, but the patient bore it remarkably well, her pulse and respiration being normal when she was put back in bed. Two hours later she was pulseless, pale, and anxious, and complained of a feeling of suffocation. As in the first case, no signs of internal hemorrhage were discoverable. In spite of the efforts at stimulation the patient's condition did not improve, but even grew worse. A subcutaneous injection of morphine was tried with immediate remarkable result. Improvement began forthwith, the pulse grew stronger, the dyspnœa disappeared, and within fifteen minutes the alarming symptoms had subsided.

The Effect of Alexander's Operation upon Labor, on the One Hand, and the Action of Pregnancy and Labor upon Alexander's Operation, on the Other. (*Centralblatt für Gynäkologie*, 1896, No. 21.) By Siegfried Stocker, M.D.

Of the thirty-seven patients on whom Stocker has performed Alexander's operation, sixteen were either single women, widows, or women who had passed the child-bearing age. Of the remaining twenty-one, ten—three of them for the second time—have become pregnant. One of these aborted in the second month, the other nine were delivered at term. Seven of the ten he examined and found the uterus in good position, the eighth was five months pregnant for the second time. Two of these women had been sterile for the two years of their married life, but became pregnant within six months after the operation. From his experience he concludes that Alexander's operation causes no disturbances in the course of future labors, and gives brilliant results in favoring conception.

Three Successful Cæsarean Sections upon the same Woman. (*Centralblatt für Gynäkologie*, 1896, No. 21.) By C. N. Van de Poll, M.D., of Amsterdam.

The first two sections on this woman were performed by the late Professor Van der Mey, and reported by him several years ago. Her pelvis was a generally contracted rachitic one, and her first three pregnancies resulted in the death of the child. She was told that a Cæsarean section would be necessary if she became pregnant again and wished a living child. Van der Mey performed this twice, each time delivering a healthy child. Seven years after the second one Van de Poll delivered the third child, but was forced to do a Porro on account of the broad, firm adhesions between the lower uterine wall and the abdominal wall. This child also lived and the woman is now perfectly well.

Ingenious Restoration of the Vagina. (*Centralblatt für Gynäkologie*, 1896, No. 21.) By A. Mackenrodt, M.D., of Berlin.

Mackenrodt suggests the transplanting of flaps, obtained from prolapse

operations on otherwise healthy women, to the granulating sides of the artificial vagina in cases of complete atresia. Of course, an attempt to restore the vagina is warranted only when the atresia is an acquired one, or, if congenital, when the uterus and tubes are sufficiently developed to carry on the generative functions. In attempting to restore the vagina in such cases great difficulty is experienced in keeping the granulating wound open long enough to allow the epithelium to extend up and cover the whole surface. To hasten the process he transplants flaps that he has obtained from the vagina of a woman suffering with prolapse. He first makes an opening between the labia in the position to be occupied by the new vagina, and then with his finger or a blunt instrument dissects an opening up to the external os or through it if the cervical canal has been occluded. The cavity thus formed is tamponned with iodoform gauze, and kept distended in this way until the whole surface is covered with healthy granulations. Then is the time for the transplanting; it may be done in one sitting or in several. The latter method takes much longer, as one graft must become firmly adherent before the next can be started, but is necessary owing to the difficulty of getting enough material to form a whole vagina at one operation.

Great care is necessary in the preparation of the flaps; they must be quite thin, of uniform thickness, and removed with great care not to injure the vitality of their tissue. The flaps, as soon as dissected off, are laid with their raw surfaces together in a warm sterile vessel until they may be used. After the flap or flaps have been fitted to the granulating surface they are intended to cover, they are kept in place with a tampon for ten days, during which time the patient must be at absolute rest in bed. In two cases on whom he has tried this method Mackenrodt claims to have obtained very satisfactory results.

Administration of Ovarian Tissue. (*Centralblatt für Gynäkologie*, 1896, No. 20.) By R. Chrobak, M.D., of Vienna.

Chrobak reports that he has tried the therapeutic effect of ovarian tissue in eight cases. To the first case he gave one and a half to two grammes (20–30 grains) of finely-chopped, fresh calves' ovaries, with a negative result. To the others he gave dried pulverized cows' ovaries compressed into pills of two-tenths gramme (3 grains) each. Six of these cases were women from whom the ovaries had been removed, who were suffering all the distressing symptoms of an artificial menopause; the other case was experiencing the symptoms of a physiological change of life.

In three of the cases in which the ovaries had been removed the treatment had been continued long enough to warrant a report. The first patient testified that after a two weeks' use of two to three pills daily the attacks of giddiness, flashes, etc., diminished from an average of ten to three per day, and entirely ceased at night. The second patient lost the attacks completely after twelve doses, and the third had on an average only half as many after she had taken twenty pellets.

The woman who was suffering from the physiological menopause stated that her symptoms were much less severe while she was using the drug.

All the patients bore the drug well and experienced no evil effects from its use.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,

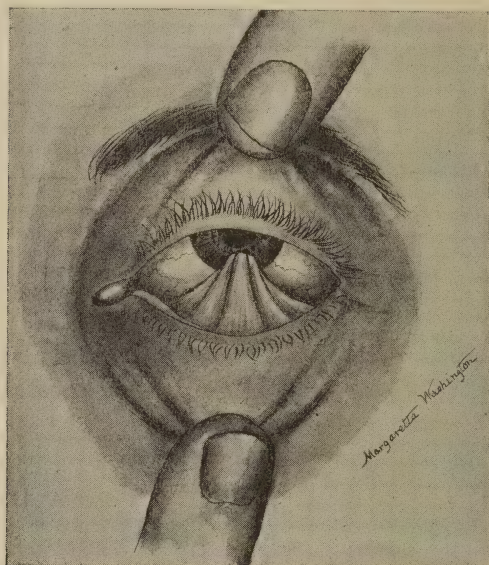
Paris, France.

Traumatic Pterygium, with a Comparative Study of the Refractive Condition of the Eye before and after Operation. (*Medical Fortnightly*, July 1, 1896.)

Charles A. Oliver, M.D., of Philadelphia, reports the case of a thirty-year-old colored man who fell from the rear platform of a trolley car. The patient sustained a series of superficial injuries about the upper portion of the left face, involving the lower lid and the inferior part of the eyeball. Although the wounds were carefully stitched by a competent physician, yet the resultant inflammation lasted for more than a month. Following the accident, the vision of the affected eye, which was as good as that of the right eye both before and for some time after the traumatism, began to grow progressively worse. At the time of the first examination, the cicatrices in the cheek and the lid were so faint and the tissues were so free and mobile that, upon casual examination, but very little if any deformity could be seen. Upon depressing but not everting the lower lid, as shown in the sketch, a broad pyramidal superficial area, situated upon the bulbar conjunctiva alone and extending from the lower cul-de-sac over the cornea to a point almost opposite to the lower pupillary border, could be seen. The mass, which was dense and vascular, was so adherent to the subjacent corneal tissue and underlying mucous membrane, of which it formed a part, that a probe could not be inserted beneath it at any point. Study of the remaining area of the cornea by magnifying lenses and the ophthalmoscope showed that the false membrane was drawn into a series of vertical folds. Uncorrected vision equalled one-tenth of normal ($\frac{5}{50}$), this being brought to one-third ($\frac{5}{15}$) by the use of a convex cylinder of three and one-half diopters strength, with its axis at 180 degrees. The right eye possessed full visual acuity. The growth was dissected free from its corneal attachments and excised. The exposed underlying submucous tissues were covered by bringing the free edges of the surrounding conjunctiva smoothly and neatly together by a series of minute and evenly placed sutures. In forty-eight hours' time the stitches were removed and seven days later the wound was healed. Ten

days after the operation uncorrected vision had risen to one-sixth of normal ($\frac{5}{30}$), it requiring but one diopter's correction of astigmatism at the same

FIG. 1.



axis as before in order to double the acuity of vision ($\frac{5}{15}$) (the same as before); this being but one-third of the cylinder lens strength that was necessary to be used before the operation.

The second and third eyes were both from a forty-five-year-old woman who died from multiple malignant growths.

The posterior halves of the two eyes were obtained, and microscopically the appearances corresponded very closely with those of the eye of the first case.

"In sections stained by Pal's method, the blue staining of the fibres in the optic nerves ceases abruptly at the lamina cribrosa, but in some sections fine-beaded, blue fibres can be seen passing through the lamina cribrosa. Blue stained fibres radiate in both directions from the optic disk, forming two triangular areas with their bases at the optic disk. The stained fibres at the apices at the two triangular areas lie in the posterior part of the nerve-fibre layer. Near the optic disk the stained areas occupy the whole thickness of the nerve-fibre layer of the retina. The retinal vessels near the optic disk are enclosed on all sides by the stained fibres. There are isolated stained fibres in the nerve-fibre layer. The minute structure of the stained fibres presents appearances similar to those in the first eye."

From these examinations the author draws the following conclusions. "The optic-nerve fibres lose their medullary sheath at the posterior part of the lamina cribrosa, with the exception of a comparatively small number which retain their sheath as far as the retina.

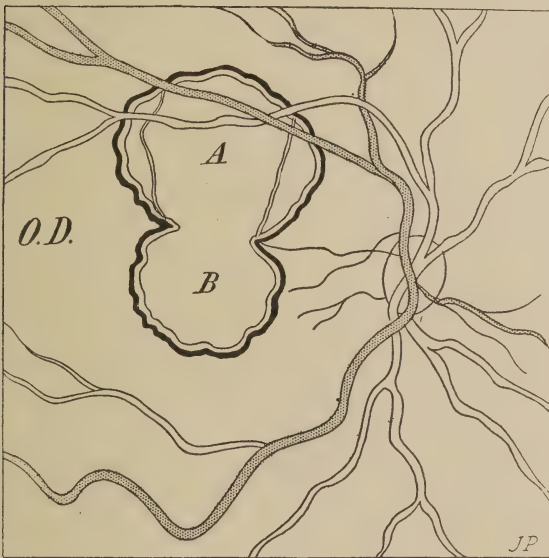
"The opaque nerve fibres in the retina, therefore, are composed of nerve fibres which again become medullated at the optic disk, and of the few fibres which retain their myeline sheath in passing through the lamina cribrosa.

"As regards the swellings on the medullated nerve fibres in the retina," he says that "the two forms evidently arise from different parts of the nerve fibres. The second form, the dark homogeneous swellings, from the character of their staining and from their situation seem, without doubt, to be thickened parts of the medullary sheath. The origin of the first form, the light homogeneous swellings, is not so clear. The medullary sheath, however, probably plays no important part in their formation, for it can be traced round the swellings unaltered in thickness and appearance. The origin must, therefore, be from the axis-cylinder, or from some substance between the axis-cylinder and the medullary sheath."

A Case of Binocular Extrapapillary Coloboma. (*Virginia Medical Semi-Monthly*, June 12, 1896.)

The accompanying outline sketches represent the vascular distribution in a case of binocular extrapapillary coloboma that has been carefully studied by John Dunn, of Richmond, Virginia. Sketch 1 shows the ophthalmoscopic appearance of a double coloboma (*A* and *B*) occupying

FIG. 1.

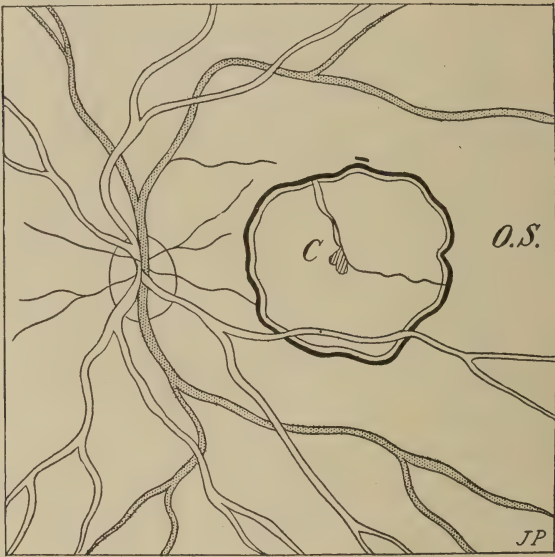


the macular region of the right eye. Here, as can be plainly seen, "the superior temporal vein of the retina crosses in a straight course the upper coloboma, subdividing just beyond its limit."

Sketch two shows the irregularly circular coloboma in the left eye. Here, as in the other eye, there is a torn pigment veil surrounding the

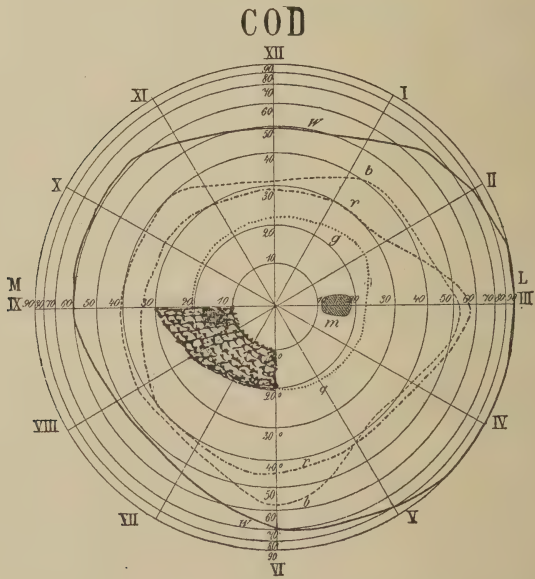
greater part of the circumference of the coloboma, the pigment being denser in some places than in others. "The retinal veins and arteries pass above

FIG. 2.



and below the coloboma, except a branch of inferior temporal artery which crosses the lower part of the coloboma, and appears to be atrophied after

FIG. 3.



reaching the coloboma." As can be seen, only one choroidal vessel enters the coloboma, and this one crosses from above as a vessel of the ordinary

size. It "runs to the centre of the coloboma, where it rolls itself into a small ball, from which emerges but a thread of vessel, which can then be followed across the outer half of the coloboma."

The field of vision for the right eye is shown in Fig. 3. The field in the left eye showed that, in spite of the size and situation of the coloboma, there was not any absolute scotoma for white, the field for this color being normal. These facts are most important, as they distinctly prove that the colobomatous areas are more or less completely covered with retinal tissue, thus explaining why the scotoma and coloboma do not correspond in size and shape, and why there may be a large coloboma and no scotoma. Moreover, it must be assumed that in those cases "where the scotoma corresponds to the coloboma, both retinal and choroidal tissues are wanting over the area of the coloboma." Finally, as the author says, "the size of the scotoma will depend upon the amount of damage done to the overlying retinal tissue by those processes, whatever they may be, which determined the choroidal coloboma."

Medullated Nerve Fibres of the Human Retina: Microscopical Examination of Three Eyes. (*Ophthalmic Review*, January, 1896.)

C. H. Usher, of Aberdeen, has had the rare good fortune of securing three human eyes with medullated nerve fibres of the retina for microscopical examination. The eyes were hardened in Müller's fluid, embedded in celloidin, and cut with a freezing microtome. The sections were stained by Pal's method, with aniline blue and saffranine (Strœbe), by Kultschitzky's logwood and eosin stain, and by a double stain with Pal's method and alum carmine.

The microscopical examination of the sections of the first case—a forty-year-old man, who died from phthisis pulmonalis, stained by Pal's method—showed under low power the appearance seen in Fig. 1.

"(1) The blue staining of the optic-nerve fibres comes to an abrupt termination at the posterior part of the lamina cribrosa.

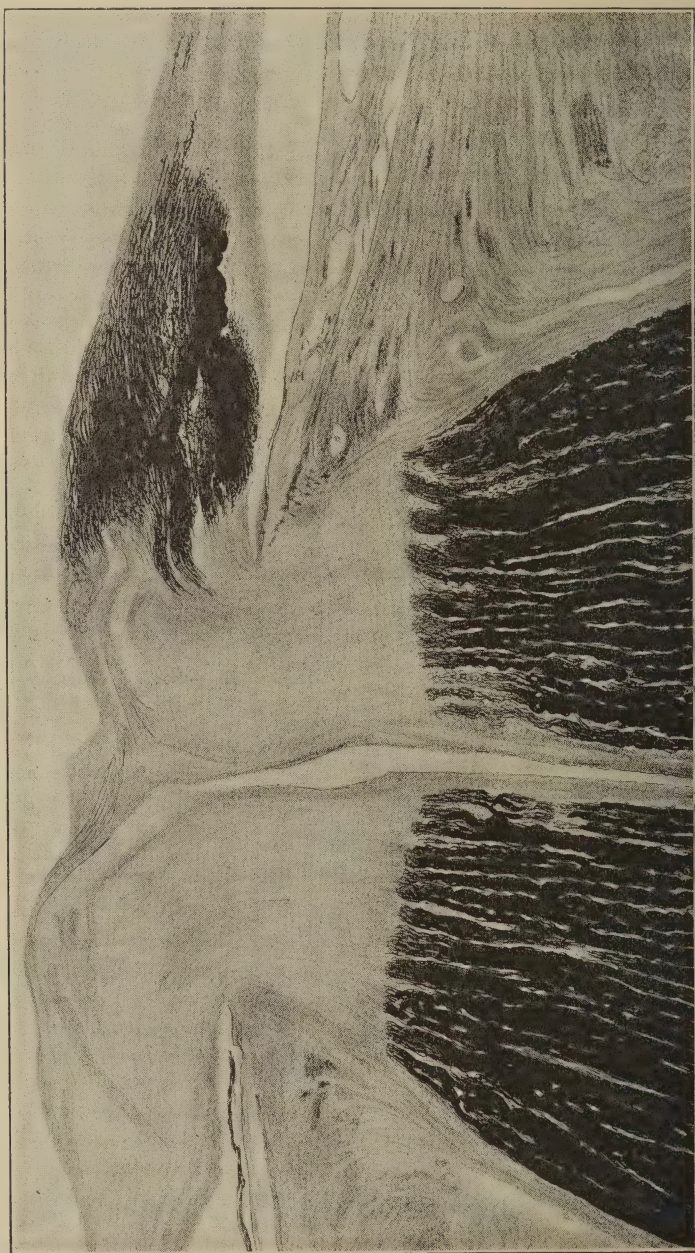
"(2) No stained fibres can be traced through the lamina cribrosa.

"(3) An exceedingly well-defined blue area in the retinal nerve-fibre layer begins on the optic disk near its upper edge, and extends upwards; the broadest part of the area is at the edge of the optic disk; it gradually narrows towards the upper part of the retina, forming roughly a triangle with its apex pointing away from the optic disk. This stained area occupies the whole thickness of the nerve-fibre layer at the disk; towards the apex of the triangle the stained fibres are much fewer in number and lie at the posterior part of the nerve-fibre layer.

"(4) A few blue-stained fibres are seen further away from the optic disk than the apex of the main area, being separated from the main area by a portion of the retina that is free from stained fibres; these isolated fibres lie at various levels in the nerve-fibre layer; some are situated anteriorly, others posteriorly.

"(5) Stained fibres are seen in the nerve-fibre layer below the optic disk, in a few sections only; these fibres are situated at a short distance

FIG. 1.



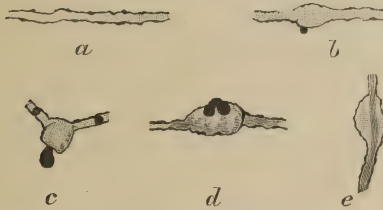
A section from the first case stained by Pal's method. $\times 50$.

from the optic disk and are very few in number. In sections made through the edge of the opaque patch only a very few stained fibres are seen; they lie at various levels in the nerve-fibre layer. In one section only two

stained fibres are seen, and both are situated at a short distance from the optic disk.

"(6) The stained fibres have small swellings on them. With a high power the minute structure of the stained fibres in the retina is seen to be as follows (Fig. 2): Each stained fibre is composed of a homogeneous sub-

FIG. 2.



Types of medullated nerve fibres in the retina, drawn from a section from the first case, stained by Pal's method. (High power, Reichert, oc. 4, obj. No. 7 a.)

stance, and is lined by a thin, dark-colored margin (*a*); the margin is not of uniform thickness, but at very short and fairly regular intervals there are very minute thickenings on it. The swellings, which were seen by the low power, are now found to be of two forms: (1) A light-colored homogeneous swelling, varying much in size and shape; some are spindle-shaped, and situated in the axis of the fibres (*b*); others are more rounded and bulge from the sides of the fibres; they measure from .005 to .020 millimetre in diameter, and they have various but generally rounded shapes; here and there is seen a group of very small swellings similar to that just described. Each swelling is surrounded by a thin dark margin of the same thickness, and presenting the same small thickenings as are seen on the nerve fibres. Some of the swellings are slightly lighter in color than the fibres, and in a few a band can be focussed in their centre (*e*). That the band occupies this situation is probable from the fact that with high magnification it is in focus at the same time as the dark margin of swelling. This band is slightly darker than the swelling it appears to pass through, but is lighter than the margin of the swelling; it seems to be continuous at each end with the homogeneous central part of the nerve fibre that is connected with the swelling. There is a possibility that this band may, in some cases at least, be another nerve fibre lying under the swelling, but the absence of dark margins is contrary to this view.

"(2) The second form of swelling is darkly stained and has great variety of shape and size, the largest measuring from .005 to .025 millimetre in length, the smallest being about the same size as the delicate thickenings on the margin of the nerve fibres. Many have a circular outline, others are irregular in shape. They are situated on the nerve fibres (*c*) and on the first form of swelling (*d*), or else they project from the margin of the nerve-fibres or swellings (*e*). A few of this second form of swelling at first sight appear quite isolated, but in nearly every case, on close focussing, a fibre is

found to lead up to them. In sections treated with aniline blue and safranin (Ströbe) swellings are stained blue on the medullated nerve fibres, but are apparently fewer in number than the swellings seen in the sections stained by Pal's method; they measure about .015 millimetre in length and .010 millimetre in breadth, but vary in size; they are for the most part spindle-shaped. Stained with a double stain of alum carmine and Pal's stain, the appearance of the medullated fibres is very little different from that in sections stained by Pal's stain alone; the central part of the fibres and swellings remained unstained, although left in alum carmine for twenty-four hours."

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

On a Special Action of the Serum of Highly Immunized Animals. (*Journal of Pathology and Bacteriology*, July, 1896.) By Herbert E. Durham, M.D.

The writer, while testing the limits of Professor Pfeiffer's method of diagnosing cholera vibrios from other closely allied vibrios, observed a most remarkable effect of the immunized serum upon different bacteria. The purpose of this article is to point out the use and limits of the phenomenon as a means of diagnosis, as a means of testing the potency of a given serum, as a means of testing the virulence of a given race of microbes, and, lastly, to indicate the relation that it has to the test proposed by Professor Pfeiffer.

"Pfeiffer's reaction" is obtained by injecting a mixture of an emulsion of the vibrios which are to be tested, with a minute quantity of the serum of a very highly immunized animal, into the peritoneal cavity of a normal guinea-pig. If the reaction is positive all the vibrios are converted into spherules in an hour or less; according to Pfeiffer, the vibrio is then to be regarded as belonging to the *same* species as that by means of which the immunization of the animal from which the serum was obtained was carried on. If the reaction is negative, the vibrio is then considered to be different in species from that used in immunization.

While making the mixture for the first injection, the writer noticed an instantaneous agglomeration of the vibrios into clumps, combined with loss of motility. This reaction of like sorts of serum on like sorts of bacteria may be best illustrated by taking the cholera vibrio as a type. The change occurs on the instant that the vibrio is placed in the serum.

A microscopical examination then shows that the vibrios are agglutinated into clumps, the fluid is free from scattered vibrios, and motility is entirely lost. There is loss of refractile power in many of the organisms and some loss of staining power. Observation with the naked eye shows flocculi suspended in the liquid, which sink to the bottom of the tube after a time, giving a clear fluid with a flocculent deposit at the bottom.

A gravitation of the vibrios leaving the fluid perfectly clear is termed a "complete action." A serum is said to be of unit standard strength when it reacts completely in an hour with its own microbe in a strength of one per cent. In weaker mixtures of a like serum the formation of the clumps can be readily watched. Vibrios that happen to hit a clump or another individual are then seen to remain adherent and to be unable to free themselves. In extreme dilutions of the active serum the fluid never becomes clear, and if it remains at all turbid, actively motile vibrios will be found microscopically.

The writer's effort to produce clumps by other means, as by the fluids of normal animals or by the serum of an animal immunized against some distantly-related organism, have failed.

In testing the action of cholera serum on different races of cholera vibrios it was found that, while the cholera serum produced by the more virulent vibrios reacts well with the less virulent, the opposite effect is not obtained; for only the less virulent cultures are powerfully affected by the serum produced by the weaker stocks. For this reason a sufficiently potent sample of cholera serum should be used for purposes of diagnosis.

Other kinds of vibrios were found to give a positive reaction when tested with their own serum; with allied species the sera may or may not be potent.

A great number of observations were made upon the typhoid and colon bacillus with a view to facilitate a differential diagnosis. Of nineteen cultures of the typhoid bacillus obtained from different sources, every one reacted strongly with ten to fifteen milligrammes of either of the typhoid sera used, but not a single one showed a vestige of clump formation when treated with the coli serum.

The colon bacillus reacts upon its own race of bacilli exactly like the typhoid serum upon the typhoid bacilli; but it does not give the faintest trace of a reaction with either of the samples of typhoid serum.

In regard to the relation of this reaction to Pfeiffer's test, the writer concludes that whatever "specific" or preferably "specialized" action a serum has upon a given vibrio, such action has already taken place before the injection is made.

A. W. P.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

COUNTERCLAIM FOR PHYSICIAN'S SERVICES ALLOWED IN AN ACTION AGAINST HIM FOR MALPRACTICE.

THE Supreme Court of Iowa, in a recent case¹ brought before it on appeal by the plaintiff from a judgment entered on a verdict in his favor in an action for damages against a physician and surgeon for alleged malpractice in reducing a fracture of the plaintiff's arm, laid down a rule of law that seems to be peculiar to that State, and at a variance with the rule of law adopted in similar cases in the other States of the United States. The Supreme Court of Iowa declares that the fact that a physician was guilty of negligence in the treatment of his patient, resulting in damages to the latter, does not necessarily preclude him from recovering any compensation whatever for his services, the amount of his recovery, if anything, depending on the amount of damages suffered because of his negligence.

The testimony at the trial in the lower court showed that the plaintiff had sustained a simple oblique fracture of the humerus of the left arm. He employed the defendant to reduce the fracture, and claims that by reason of the negligent and unskilful treatment he received his arm is useless, and he is permanently disabled. The defendant admitted that he was called upon to set the plaintiff's arm, but denied any negligence or unskilfulness in so doing; and he claimed that, after he had ceased the treatment and discharged the case, the plaintiff, while carrying some heavy article, slipped and fell, and injured his arm, and that he neglected to notify defendant thereof, or to call any other physician to treat the same, and that, by reason thereof his arm is bent and injured, and that the present condition of the plaintiff's arm is due to his own negligence and the accident aforesaid. The defendant further pleaded a counterclaim for services rendered the plaintiff in reducing the fracture. The jury returned a verdict for plaintiff in the sum of one dollar, and from the judgment entered on this verdict the plaintiff appealed.

Among the errors complained of was one to the charge of the court instructing the jury as to the measure of damages, as follows: "You will determine the amount, if anything, due the plaintiff on this claim, and the

¹ White vs. Hale, 66 N. W. Rep. 894 (1896).

amount, if anything due the defendant on his counterclaim, and, after deducting the lesser from the greater amount, you will return your verdict for the difference, if any, in favor of the plaintiff or defendant, as you find the fact to be. If you find nothing due either party, you will simply return a verdict in favor of the defendant."

To this charge of the trial court the plaintiff's counsel excepted, his contention being that the two claims for service and malpractice cannot co-exist, and that a recovery by either is a bar to an action by the other. "That there are some authorities," says the Supreme Court, "in support of plaintiff's contention will be conceded; but we do not think these cases announce the correct doctrine. The rule in this State, long ago established, is that a party who has failed to perform his contract in full may recover compensation for the part performed, less the damages caused by his failure to perform the whole contract. It does not necessarily follow that, because a physician or surgeon may be guilty of negligence, which causes some inconsequential or inconsiderable injury, he is to be deprived of all compensation for his services on account thereof. Whether he shall lose the value of his services depends upon the amount of damages suffered by reason of his neglect to perform his duty. No penalty beyond the amount of the actual damages sustained is to be visited upon him because of his negligence or want of skill." And the judgment of the trial court was accordingly affirmed.

It is to be observed, however, that the rule of law contended for by the plaintiff, in this case,—namely, that a recovery by a physician or surgeon for his services will constitute a bar to an action by his patient for malpractice, or, on the other hand, that a recovery of damages by a patient in an action against his physician for malpractice is a bar to the latter's recovery of compensation,—announces the law prevailing in the States of the United States, perhaps with this exception. And the point may well admit of reargument before the Supreme Court of Iowa.

BOOK REVIEWS.

THE HISTORY OF PROSTITUTION; ITS EXTENT, CAUSES, AND EFFECTS THROUGHOUT THE WORLD. By Wm. Sanger, M.D., Resident Physician of Blackwell's Island, New York City; Member of the American Association for the Advancement of Science; late Physician to Marine Hospital, Quarantine, New York, etc., with Numerous Editorial Notes and an Appendix. New York: The American Medical Press, 1895. 816 Broadway.

Undoubtedly Dr. Sanger, in undertaking his work, hoped to arrive at facts and conclusions which might form a valuable basis for efforts to ameliorate or suppress prostitution. Diving for his truth into a very malodorous cesspool, he seems somewhat disappointed himself when he emerges with the results of his find.

For what is the result? From earliest ages he finds prostitution rampant in every age and every clime, and wherever and whenever efforts at its suppression were undertaken, he finds it under new forms, hidden, but still more pernicious; under the smiles as under the frowns of religion and the state, it grows with the growth and contributes to the decay of many a promising body politic.

Possibly the difficulty experienced in all efforts at reforming and obliterating this dark spot in society comes from ignoring the fact that passion and want are the two fundamental instincts upon which depend the existence of man, and that society in its war against prostitution is fighting immutable laws and vast unseen forces that laugh at morals, care not for religions, but extend their mighty roots far down, through men and animal and plant-life into the very realm of the inorganic world; that the enticements of sex and the pangs of hunger are equally important if man is to continue on the earth, and that in prostitution we have to meet a union of both against which organized society wars forever in vain.

Make the enticement valueless and none will desire it; grant its rewards to all who ask and none may ask more; enforce the marriage of all as soon as the age of desire is reached, and none may seek illicit union; or, again, abolish want and none will need to try this way of earning the bread with which to sustain life or the covering to keep out the cold. Or diminish the attractions of the female sex for the male. All these methods of attacking the evil would be scientific and rational; but to suggest, as Dr. Sanger seems to, a law making marriage before twenty-five a penal offence seems the height of absurdity.

In fact all reformatory methods upon which modern society plumes itself are but a gleaning of the scattered grain, while prostitution sweeps away the ripened harvest.

Society, sad to say, saves too often the sexual virtue of its few at the expense of its many, as fortunes accumulate for the few on the ruin of the rest. Yet who can blame it? Only one sometimes smiles at its outcry against the evils that itself, by its very existence, of necessity creates, and by which and on which, rotten foundation though it be, it lifts its own favored and dear ones aloft in the sunshine of life and the purity of the mountain air, while below, under its feet, in the fetid marshes and tangled thickets, it stamps regretfully a million down the deeper into the mire of suffering and sin.

EDWARD W. WATSON.

DIETS FOR CHILDREN. By Louis Starr, M.D. Price, \$1.25. Philadelphia: W. B. Saunders, 1896.

This collection of dietaries will prove very useful to physicians in the management of children, both sick and well. They are arranged under twenty-one heads, after which follows a set of charts for the preparation of different diluents and foods. By detaching the sheets and making such adaptations as will be necessary in individual cases, both physician and parent will be able to pursue a more intelligent plan in regard to diet than is customary in general practice. The high standing of the author is a sufficient guarantee of the trustworthy character of the book. G. H.

THE TOXIC AMBLYOPIAS: THEIR CLASSIFICATION, HISTORY, SYMPTOMS, PATHOLOGY, AND TREATMENT. Being an essay to which was awarded the Alvarenza Prize of the College of Physicians of Philadelphia, October, 1894. By G. E. de Schweinitz, A.M., M.D. Philadelphia: Lea Brothers & Co., 1896.

The study of the toxic influences exerted on workmen and others by the multitude of substances for which our civilization has found a use is of great and increasing importance. Of this study in its wider sense the present volume deals with those organs in which alone, if we except the blood, we are able to examine the progress of minute tissue-changes during life. The general medical reader may, therefore, take up the book with the anticipation of a lively interest.

Using the term amblyopia in its broad etymological sense of "dimness of sight" the expression toxic amblyopia includes every loss of visual function, whether for form, light, or color, due to the influence of a drug. Excluding the "dimness of sight" due to the paralysis of accommodation and that due to glaucomatous symptoms following the use of mydriatics, the subject still embraces practically the entire range of ocular drug action. Following Leber, the modern monographers cover all of the field within these wide limits, and one is, therefore, in a measure prepared for the number and variety of the toxic substances which an industrious search among case-reports brings to light. The present author's list is longer than that of any of his predecessors, containing, as it does, over eighty agents. Some of these, however, are only mentioned in order to deny the amblyopic properties elsewhere attributed to them. The classification of such diverse materials as this list contains by any system dependent on chemical or therapeutic affinities is a task which is wisely not attempted. Each substance has, therefore, received separate consideration, though they have been formed into groups for convenience of treatment.

The reader will be apt to turn to the chapters on alcohol and tobacco as furnishing the most familiar evidence of the quality of the book. Over one-third of the pages are devoted to these substances, and it must at once be admitted that the work is extremely well done. Particularly admirable is the exhaustive study of the visual fields, which bears so large a part in the practical diagnosis of alcohol and tobacco amblyopia, and the clearness of the differential diagnosis from non-toxic axial neuritis, locomotor ataxia, and scotomatous atrophy of the optic disk.

The amblyopias are diseases of commission rather than of omission, and the diagnosis, therefore, almost includes the treatment. The paragraphs which the author devotes to this subject contain judicious reference to all the measures which have been found useful in conjunction with the withdrawal of the toxic agent.

We have not space to follow in detail the interesting chapters on bisulphide of carbon amblyopia, which has not yet been reported from this side of the Atlantic; on iodoform amblyopia, of which the reported cases number only four, and on the various useful substances which have occasionally proven detrimental to the eyesight. These chapters will prove valuable to topical inquirers, containing, as they do, in a condensed form much information of a special kind that is not generally accessible. The various ocular lesions which lead is capable of causing have, perhaps, received less

attention than one would expect in view of their destructive nature and their similarity to non-toxic affections. The author regards as proven that lead produces optic neuritis independently of nephritis or cerebritis.

The record of the experiments in the production of quinine amaurosis in dogs have already been printed, but are well worthy their new dress and permanent form. The general subject of quinine amaurosis is treated in a careful chapter which forms one of the most enjoyable sections of the book. In addition to those with the salts of cinchona bark the essay contains records of experiments with alcohol, salicylic acid and salicylates, and male fern.

For the book as a whole one can have only genial words. Its special features, aside from those which we have pointed out in the text, are the nine beautiful plates, principally of microscopic sections, and the very complete and exact bibliography accompanying each section. The care and industry which have gone into these lists of references will place future students of this subject long in debt to de Schweinitz's scholarly monograph.

R. J. P.

ANNUAL REPORT OF THE BUREAU OF HEALTH OF PHILADELPHIA, 1895.

This report contains valuable information as to the safeguards that are thrown around the inhabitants of a great city. The favorable condition of Philadelphia's health reflects great credit on its health bureau. The city, from having, probably, the poorest paved streets of any large city in the country, has now the best, and it is not only the main streets that have been improved but a large number of the small streets and courts have been reconstructed by the introduction of proper drainage and impervious pavements, all conducive of cleanliness, which is of the utmost importance. The removal in summer of thousands of children daily by the fresh-air excursions has had a very beneficial influence on the health of young children. Among the safeguards in force is the active inspection of milk. Thirty-five prosecutions were brought, and in eleven cases the parties pleaded guilty. Milk and water analyses and examinations of sputum and of suspected diphtheria are made without cost in the city's biological laboratory. During the year one hundred and forty-five thousand head of cattle were inspected, and one hundred and sixty-two were condemned and destroyed. Of these one hundred and twenty-nine were affected with tuberculosis, five with actinomycosis, and twenty-six with various other diseases. Ten persons were arrested and held for trial for selling, or exposing for sale, unwholesome flesh.

Philadelphia also requires the examination and registration of plumbers. Of one hundred and sixty-four applicants fifty-six were rejected. In two instances plumbers have been disciplined for flagrant disregard of the rules of the board regulating house-drainage. All these measures are highly salutary, and are being rewarded by a falling death-rate.

Publications of this nature ought to have an index.

G. H.

ROYAL INFIRMARY CLINQUES. By Alexander James, M.D., F.R.C.P.E. 8vo, pp. 166. Edinburgh: Oliver & Boyd, 1896, 5s.

Sixteen lectures are contained in this volume. The subjects have been closely studied and by means of numerous illustrations one follows with interest the cases as they are presented. The subjects chosen are empyema; fibroid phthisis; cardiac disease; primary contracting kidney; hydronephrosis treated by aspiration; diabetes; two cases of cirrhosis of the liver in children; dysentery treated by demetized ipecacuanha; aortic aneurism; epilepsy; spinal injury; a case of Friedreich's ataxy, in which, by the way, there was no evidence of heredity. Eleven such cases were recorded in Griffith's monograph. Tracings are given of the sway in this case taken by means of the taxograph. With his eyes open the lines were

fairly even, but when they were closed the undulations were marked, exactly as in the case of an ataxic patient.

Lectures on combined paralysis of the arm due to injury, a case of lesion of the pons, and a case of Addison's disease, with good photographic illustrations complete the book. G. H.

A TEXT-BOOK OF BACTERIOLOGY. By George M. Sternberg, M.D., LL.D., Surgeon General U. S. Army. Octavo, 693 pages, illustrated by heliotypes and chromolithographic plates and 200 engravings. New York: William Wood & Co., 1896.

The essential difference between "The Text-Book" and "The Manual of Bacteriology," which appeared from the same author in 1892, is that the former is less bulky than the latter, and in many other ways more suited to the needs of a larger number of readers. In constructing "The Text-Book" from "The Manual" the alterations have been mainly subtractive. The bibliography and certain detailed discussions, which made "The Manual" especially useful to the specialist as a reference book, have been eliminated from "The Text-Book," likewise the descriptions of a number of non-pathogenic species which were of little importance or interest to the general readers have been omitted. On the whole, these changes appear to be for the good of the book, in so far as its popularity is concerned: they decrease its size, diminish its cost, and thereby insure its wider circulation.

The subject-matter is presented under four parts, subdivided into headings.

Part I.—Includes history, morphology, and general technique.

Part II.—General biological considerations, including a detailed consideration of the subject of disinfection.

Part III.—Comprises descriptions of pathogenic species of bacteria.

Part IV.—Treats of saprophytic bacteria.

The mechanical features of the book are good.

A. C. A.

NYNAISM. Pamphlet, pp. 122. Philadelphia: Nyna Publishing Company, 1896.

We see the birth of another *ism*. Nynatism, which owes its origin to inspiration derived from the publications of the Ralston Health Club, is the mystic name for a society, clique, club, association, principle, or whatever one wishes to call it, the object of which is to induce the perverse human being to adhere to the rules of hygiene, to influence these same human beings to stop taking quack and patent medicines, and to bring about the return of the human race to rules of living which will result in vigorous old age. In a word, as the introduction has it, the *ism* is an attempt to "popularize hygiene." Nyna, when translated into English, means nine a's, at least so the reviewer gathers from the perusal of the pamphlet. These nine a's are administrativeness, activeness, agreeableness, alimentation, aeration, appeasement, accoutrement, ablution, and actinism. Perfection in these qualities is to be striven for by daily exercises, one exercise for each quality. These exercises are in corresponding order: approximation, focalization, conciliation, mastication, inflation, relaxation, protection, humidation, ventilation.

Those who are willing to join the movement are exponents; each exponent endeavors to obtain other exponents; and ultimately, in the words of Colonel Mulberry Sellers, there will be millions in it. If the human race in a body should flock to the standard of the new *ism* we would ultimately see the world peopled by beings who would be devoid of nerves, who would possess unclouded intellectual faculties and clear-cut vision, and who would be above petty annoyances. Further, these ideal individuals would masticate their food properly, would use their respiratory apparatuses thoroughly, and would always obtain a sufficient amount of rest. Besides all this, we would find them properly clothed, cleanly in body, and living in houses

which would be properly ventilated. And, finally, they would cease experimenting on their own animal economies with the evil concoctions of the patent medicine man. Seriously, there is something in this new move if it can be popularized, and, even if the ideal is not reached, much may be done to improve the condition of the people.

No names appear connected with the movement, and the future alone will tell whether it is destined to be successful, as it is a notoriously difficult task to induce people to take care of themselves.

J. M. S.

ITEMS OF INTEREST.

THE issues of the *British Medical Journal* and of the *Lancet*, under the date of September 5, 1896, are known as the students' number. In

Medical Educa-
tion in Great
Britain.

these journals voluminous information is given the English student about beginning his education. From this material we may glean some interesting facts. It would

seem that the General Medical Council determines the main outline of the medical curriculum. This council lays down the minimum standard of school knowledge which shall be possessed by a student before he commences his professional study and the minimum number of years during which such study shall be carried out, and at the same time enumerates the examining bodies, the possession of whose degrees and diplomas shall entitle the holder to be registered as a medical practitioner. The various medical schools, so long as they comply with the instructions of the council, arrange their examinations as they like, and grant such diplomas and degrees as their various charters call for. Every medical student must be registered by the General Medical Council at the commencement of his studentship. In order to be able to register a student must pass a preliminary examination in general education, and must produce evidence that he has commenced medical study. A list of ninety examining bodies is given, whose examinations in general education are recognized by the council. These examinations require as a minimum of education about what is required for entrance into any of our prominent American universities. The subjects in which examinations are held are:

(a) English Language, including Grammar and Composition.

(b) Latin, including Grammar, translation from specified authors, and translations of easy passages not taken from such authors.

(c) Mathematics, comprising (a) Arithmetic; (b) Algebra, as far as through simple equations; (c) Geometry, the subject matter of Euclid, Books i., ii., and iii., with easy deductions.

(d) One of the following optional subjects: (a) Greek; (β) French;

(γ) German; (δ) Italian; (ε) any other modern language; (ζ) Logic. After a student is registered with the council he may choose the medical school at which he is to take his final examination. The course of study for the professional degree must be five years, unless the student be a graduate in arts or science of any university recognized by the General Medical Council, who has spent a year in the study of Physics, Chemistry, and Biology and has passed examinations in these subjects. Such a student is considered to have completed one of the five years of study. The course of professional study and examinations must include the following subjects: Physics, Chemistry, Elementary Biology, Anatomy, Physiology, *Materia Medica* and Pharmacy, Pathology, Therapeutics, Medicine, including Medical Anatomy and Clinical Medicine, Surgery, including Surgical Anatomy and Clinical Surgery, Midwifery, including Diseases peculiar to Women and to Newborn Children, Theory and Practice of Vaccination, Forensic Medicine, Hygiene, and Mental Disease.

"The attention of the student," says the *Lancet*, "to these, according to our examining bodies, is at present so deficient that in 1892 out of two thousand six hundred and twelve examinations in the final subjects there were one thousand and seventeen rejections." Mr. Teale has laid the blame of this large number of rejections at the door of the teaching and examining system. The cost of the five years' study, including books, instruments, board, clothing, etc., is estimated by the *British Medical Journal* at from £687 to £734 3s., or from, in round numbers, \$2935.00 to \$3671.00 in American money. The *Lancet* considers that each student should be able to command £100 (\$500) per year regularly for at least four out of the five years of his curriculum, making the total cost for the five years £500 or \$2500.00 of our money.

The *American Medico-Surgical Bulletin* informs us that Dr. Irwin, who was a member of the suite attached to the person of Li Hung Chang on his recent visit to this country, is of English parentage.

Li Hung Chang's
Physicians. Dr. Irwin had met with some distinction in his hospital work in England, and went out to China in 1876. He settled at Tien-Tsin, the home of Li Hung Chang, and a short time after his settlement there he was called to attend a severe case in the imperial yamen. The patient recovered, and not long afterwards Dr. Irwin was appointed chief physician to the viceroy and his family. Li Hung Chang's wife was among the patients of Dr. Irwin, and was also one of his fast friends. Dr. Irwin has received the honor of the imperial order of the Double Dragon through the influence of his noble patron, and during the recent Chino-Japanese war was advanced in the order for valuable services rendered to the medical department of the Chinese army. While in this country Dr. Irwin took particular pains to deny the stories

which were put in circulation, to the effect that Li Hung Chang and the official members of his party were addicted to the opium habit. Dr. Irwin explicitly stated that not only was the viceroy not given to opium-smoking, but that that habit was one which he most thoroughly detested, and which he had made most strenuous efforts to discourage among his own nationality. The viceroy is an habitual tobacco-smoker, using both pipe and cigarettes. The second physician of the viceroy's suite, Dr. Mark, is a full-blooded Chinese, who for some reason has assumed a Christian name. He is reported to be a skilled physician.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for accepted articles after publication; or reprints, if stated on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 716 Filbert Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

NOVEMBER, 1896.

[No. 10.]

ORIGINAL COMMUNICATIONS.

SYRINGOMYELIA.

*BEING THE ALVARENGA PRIZE ESSAY OF THE COLLEGE OF
PHYSICIANS OF PHILADELPHIA FOR THE YEAR 1895.*

BY GUY HINSDALE, A.M., M.D.,

Philadelphia.

IT is over one hundred and fifty years since Morgagni and Santorini observed and recorded the existence of an abnormal cavity in the spinal cord.

Portal in the year 1800, and Rachetti in 1816, also noted this strange phenomenon, which had from time to time excited the curiosity of anatomists of the seventeenth and eighteenth centuries. The pathological condition passed without a distinctive name until, in 1837, Ollivier, of Angers, called the affection "syringomyelia," by which it has since been generally designated. The word itself is from the Greek *συριγγῶν*, "to become hollow," and *μυελός*, "marrow," a combination which clearly expresses the macroscopic appearance when section is made of a typical specimen. The next step was the discovery in 1859, by Stilling, that the spinal cord is normally provided with a central canal which is constant throughout life. Virchow and Leyden then looked upon all cavities in the cord as expansions of the normal central canal, and termed the condition "hydromyelia." Ollivier is said to have attributed to the affection very little pathological significance, and certainly did not connect the condition with any clinical symptoms; thus all writers down to within twenty years or even less gave very little value to the condition other than as being merely a pathological curiosity and of little importance. It transpired, however, that in cases where these cavities were found at an autopsy the clinical histories bore a strong resem-

blance in some respects. Disorders of sensation had been observed; burns and wounds received during later years had been sustained without pain; certain muscles had wasted and there had been the symptoms of muscular weakness to such an extent as to interfere with the customary avocations. It thus became evident that the cavity and the surrounding histologic change were accountable for a train of clinical symptoms which had not been heretofore attributed to a definite locality in the central nervous system.

The first differentiation of these cases was made when a pathological condition, evidently congenital, was distinguished from a cavity acquired in later life as the result of accidental causes or the growth of new formations in the spinal cord. For the congenital affection it has been found convenient to retain the name hydromyelia; but for the cavities secondarily produced, even though they may be considered as remotely due to a developmental defect dating as far back as intra-uterine existence, it has generally been the custom to use the term syringomyelia, as originally proposed.

FIG. 1.



Hydromyelia from a child two years old, with encephalocele and absence of cerebellum. (From Gowers, after Leyden.) In A, cervical region, the central canal is large, lined with epithelium, and from it a median fissure extends backward nearly to the periphery of the cord, limited by a layer of homogeneous tissue, more abundant at the posterior limit. In B, lower down, the fissure is enlarged to a cavity of considerable size, while in C it is still larger, and the posterior columns are reduced to a narrow zone between the layer of tissue which bounds the cavity and the gray substance.

The definition which we adopt, and to which every author will doubtless assent, is that syringomyelia is a chronic affection of the spinal cord characterized anatomically by the pathological formation of cavities in its substance, and clinically by peculiar disturbances of sensibility associated with trophic disorders. The seat of the primary lesion may extend as high as the medulla or as far downward as the lumbar region; the seat of the secondary changes is peripheral, involving the muscles, the bones, the cellular tissue, the skin, etc.

Two other terms have been proposed, but they have not been accepted by the profession. One is "myélite cavitaire," of Joffroy and Achard, which indicates the secondary nature of the cavity, but it is objectionable on account of the term myelitis, which, in the usual acceptation of the term, misrepresents the primary pathological condition.

The other name, proposed by Sachs and Armstrong, is myelosyringosis. The term is no doubt a correct one for the condition, but it is not so euphonious as syringomyelia, and will probably never come into use.

It was a distinct step in advance when it was recognized by Hallepeau, in 1869, that it was not so much the cavity *per se* that was the main element

in the pathological condition, but rather that the cellular changes which take place in the cord constitute the primary lesion, and that the dilatation of the cavity is only secondary. Hallopeau's explanation was that a myelitis occurred with sclerosis of the periependymal tissue; as the latter gave way the central canal was thus secondarily excavated into a large cavity.

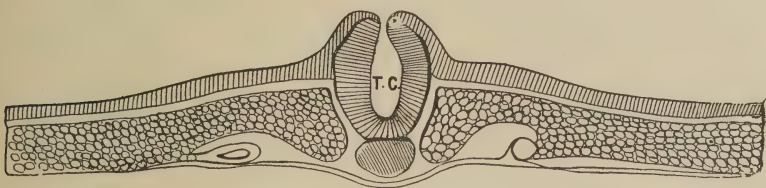
This statement seemed beyond criticism until further studies revealed cavities in the cord independent of the central canal and not even communicating with it.

Simon, of Paris, contributed much to the elucidation of the subject, which had now become greatly confused owing to the successive change of views. His studies, which were published in 1875, called attention to the coexistence of the cavity with vascular tumors, to which he gave the name of "gliomes telangiectasiques," and rightly claimed that the cavity resulted from softening of the glioma and absorption of the degenerated structure.

In Simon's opinion, which is now generally adopted, hydromyelia was reserved for "*la dilatation et l'hydropisie du canal d'ependyme, affection en tout comparable à l'hydrocéphalie*," and to use the word syringomyelia to designate "*les cavités et productions kystiques que l'on peut rencontrer dans la moelle indépendamment du canal central*."

Much more attention has been directed in later years to the study of the symptomatology of syringomyelia. The train of clinical symptoms and their explanation by post-mortem studies furnish one of the most beautiful subjects for the student of clinical medicine and pathology. The statement that a diagnosis can only be made at the autopsy has been relegated to history. The rigorous efforts of Morvan to establish an identity for the disease, which he described as "*paralysie analgésique*" or "*parésie analgésique à paralysie des extrémités supérieures*," have likewise been unsuccessful, for the best observers are now nearly united in classifying this affection as one of the forms or types of syringomyelia and not a disease *sui generis*.

FIG. 2.



Transverse section of a chick showing medullary canal (T. C.) beginning to close.
(From Kölliker.)

The various forms of this interesting disease, which is already the subject of a vast amount of literature,¹ will be considered more particularly in succeeding chapters.

Histology and Pathology.—In the development of the spinal cord of the embryo the germinal space or area in its very earliest stage takes on an

¹ In the bibliography prepared by the author there are 500 references.

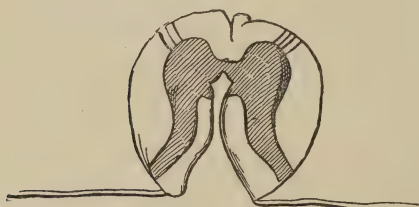
elongated form, a central longitudinal line called the primitive groove. The sides of this primitive furrow are composed of two longitudinal ridges of the external layer or fold (epiblast) of the blastoderm.

These close in so as to form a canal constituting the fundamental central canal of the cord, the fourth ventricle (which is only partially enclosed), and the ventricles of the brain. The walls of this canal are thinner in front and behind than at the sides, and the epithelium of the central canal is derived from the same external layer (epiblast) of the blastoderm, the nerve elements themselves being derived from the middle layer, the mesoblast, subjacent to this epithelium. The central canal is at first closed behind by only a thin layer of cells which meet across the middle line, the remnant of this fissure forming the posterior median fissure, the closure occurring from behind forward as the median parts of the posterior columns develop.

The nature of the cellular constituents of the cord must be also understood in an explanation of the pathological changes. All the parts consist first of embryonal cells, or plasmatic cells as they are sometimes called,—embryonic cells, because they are the same in the adult as they were in the embryonic stage. Such cells easily undergo transformation, however, decaying, perhaps, or furnishing new forms that become pathological.

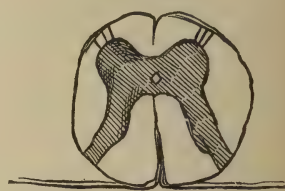
As the embryo develops, some of the embryonal cells are transformed into the nerve-elements, the cells of the gray matter taking shape before the fibres of the white columns. Others persist, forming the neuroglia and the gelatinous gray substance continuous with it around the cord, at the posterior root fissure and around the central canal (Gowers).

FIG. 3.



Representing the posterior end of the spinal canal open. The anterior and lateral columns have been formed. The posterior columns encroach on the canal.

FIG. 4.



Development of the cord complete by the growth of the posterior median column. The spinal canal is closed.

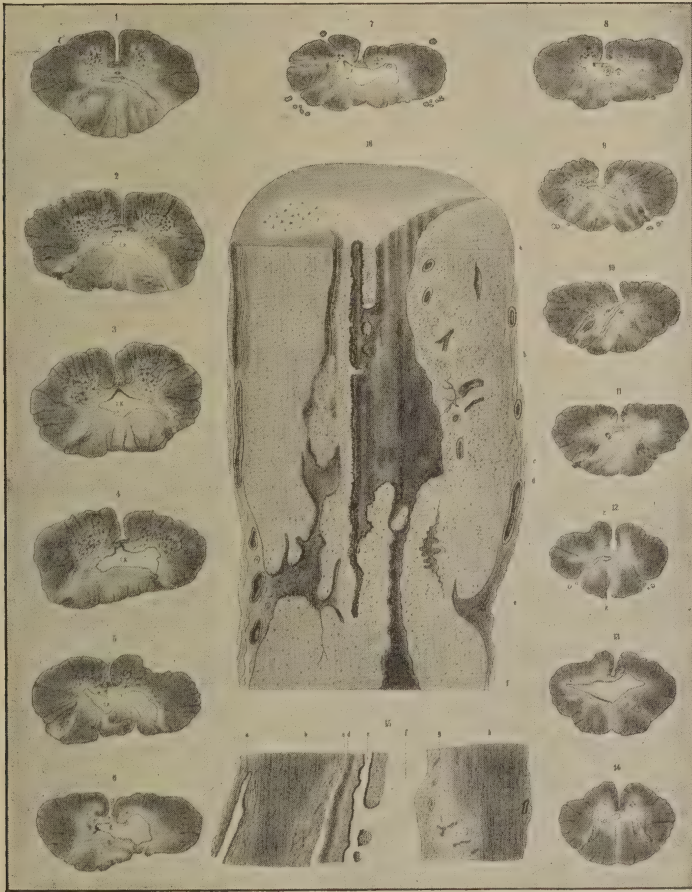
It is therefore to be noted that the cells surrounding the central canal and extending to the posterior root fissure are the very cells most prone to undergo transformation. The central canal is finally located in the anterior part or middle of the gray commissure. It is barely discernible to the naked eye either as a slit extending laterally or antero-posteriorly, or circular in section, or may, in exceptional cases, be normally closed by the epithelium which usually lines its wall.

The development of the cord may stop at several stages short of comple-

tion. The central canal may remain abnormally large in proportion as the junction of the dorsal portion of the cord occurs at any position between the normal one and the hindmost limit of the posterior fissure.

The boundaries of the canal may be symmetrical or, if the junction has taken place unevenly, a portion of the original posterior fissure, or an offset from it, may be thrown sideways into either the right or left posterior column, decentering the cavity and giving it an asymmetrical outline.

FIG. 5.



Syringomyelia. Case of E. Asmus. Cavity extends from the third cervical to the tenth dorsal segment. The right posterior horn chiefly affected. The anterior horns intact. Specific history.

It has been suggested also that in some cases the cord may be normally developed as far as external appearance goes, but may contain an undue amount of embryonic neuroglia, in which a hemorrhage or liquefactive degeneration may easily be determined by degrees of violence which would be insufficient to affect a normal cord.

It can therefore readily be understood that in some cases of syringomyelia we may deal with a congenital weakness if not an actual defect, a

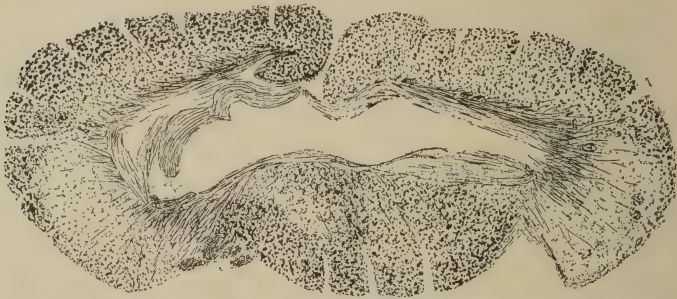
developmental irregularity in the distribution of cellular elements; that, furthermore, the filling up of congenital or acquired spaces in the neuroglial element with the products of some new formation, glioma for example, and the exercise of pressure from within outward, will react upon the gray matter, so that as it degenerates the intrinsic symptoms of the disease present themselves, and as later the white matter itself undergoes transformation, the extrinsic symptoms are added to the list.

Pathology.—On examining the cord as it lies in the vertebral canal the general appearance may be entirely normal. The meninges are apparently healthy, but upon opening the dura mater, if the case be well marked, the cord will bear a strong resemblance to a large blood-vessel filled with a moderate quantity of fluid, having walls reduced in thickness in proportion as the gray matter has been destroyed. On pressure it is found to lack resistance, being soft and fluctuating. In extreme cases it may be of ribbon-like appearance. The cervical enlargement is relatively great, or at whatever locality a glioma may be present there may be a fusiform swelling. The cervical and upper dorsal regions are the usual seats of the affection.

The external appearance is not always so characteristic in cases of moderate degree.

On cross-section the distinctive features of the disease are apparent to the naked eye. In successive sections of a well-marked specimen we may trace the glioma and its cavity throughout its vertical extent.

FIG. 6.¹

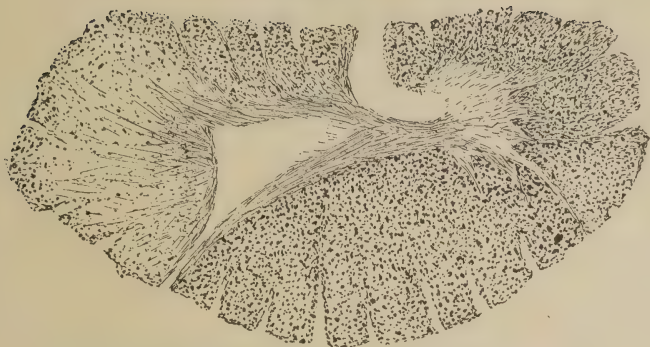


SYRINGOMYELIA.—Upper cervical region. Here the cavity extends far across the cord, almost symmetrically on either side. The gliomatous formation extends out along the posterior horns, almost cutting off the posterior columns from the rest of the cord. The lateral tracts are much degenerated, especially the right, and the right direct pyramidal tract. Remnants of the anterior horns can be made out as narrow projections in front of the cavity (the left alone is shown in the drawing); they contain only a few multipolar cells degenerated. The anterior parts, especially, of the posterior columns, are degenerated. But little trace of posterior root-zone. The gliomatous tissue extends almost entirely around the cavity as a rim or circle.

The cavity is usually single, but there may be several cavities independent of each other or intercommunicating. The cross-section of the cavity is generally elliptical, or merely a narrow slit with the long diameter

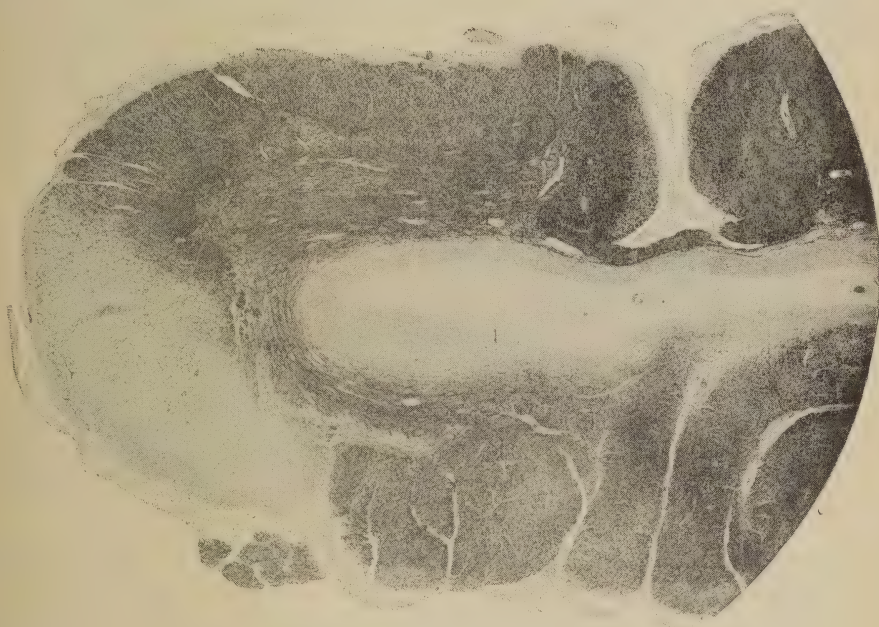
¹ The author wishes to express his indebtedness to Dr. James Hendrie Lloyd for the use of these valuable illustrations, which were executed from photographs by Dr. William M. Gray, of the Army Medical Museum, Washington.

FIG. 7.



This drawing represents very well a section from the mid-dorsal region. (The image is reversed.) The cavity is to the right (left in figure), and follows out the posterior horn quite to the periphery. The right lateral tract is very much degenerated, and the left is rather more so than is shown in the drawing. The right anterior horn is also practically destroyed. The left anterior horn preserves its shape, and under the microscope some motor cells are visible in it. The posterior columns show degenerated fibres scattered through them.

FIG. 8.

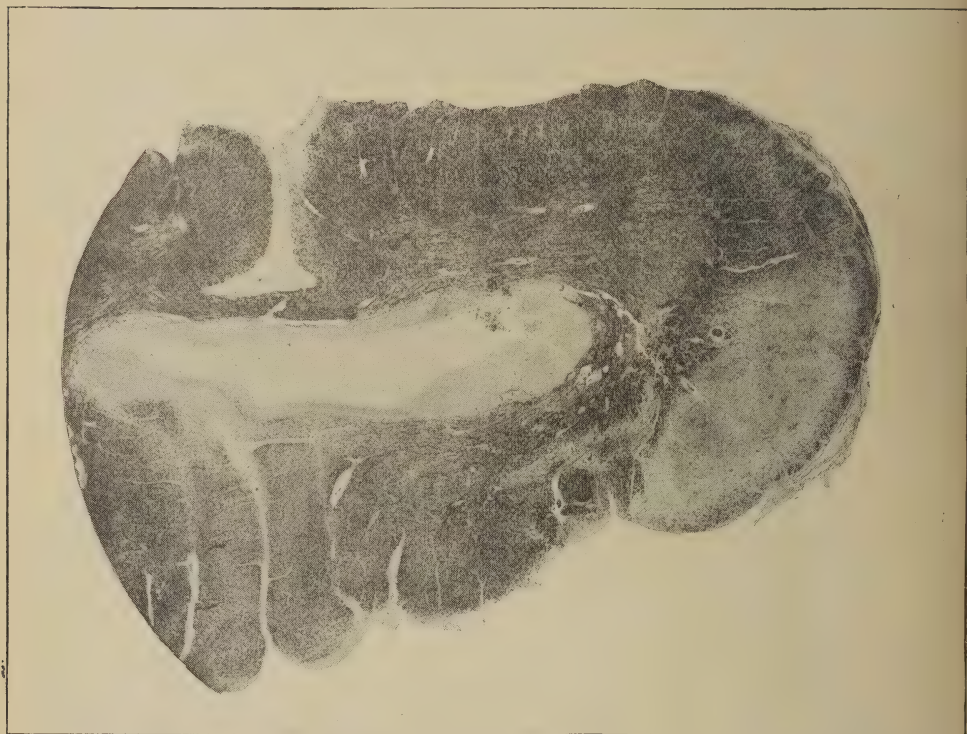


SYRINGOMYELIA.—Cervical enlargement. The cavity here begins to trend towards the right side (left in the photograph). It is lined with a gliomatous material. Remains of the central canal can be seen in a group of epithelial cells in front of the cavity and to one side of its normal position. It presents irregularly the outlines of a double canal. It does not appear in the photograph. The anterior white commissure is preserved. The gray matter is stretched around the ends of the cavity, and only a few multipolar cells are visible (very indistinct in this photograph) in the anterior horns. The lateral pyramidal tract is deeply degenerated, and the direct pyramidal tract slightly so. The posterior horns and root-zones cannot be well distinguished.

transverse (Figs. 6, 8, 9, 10). The shape of the cavity varies very largely, and its long axis may lie in almost any direction, very commonly extending obliquely in the direction of one of the posterior horns. (Fig. 7.)

The dimensions of cavities vary greatly in different cases and at different levels in the same case, measuring one millimetre or less up to almost the entire thickness of the cord, and usually attaining their maximum in the cervical region. While the cervical and upper dorsal portions of the

FIG. 9.



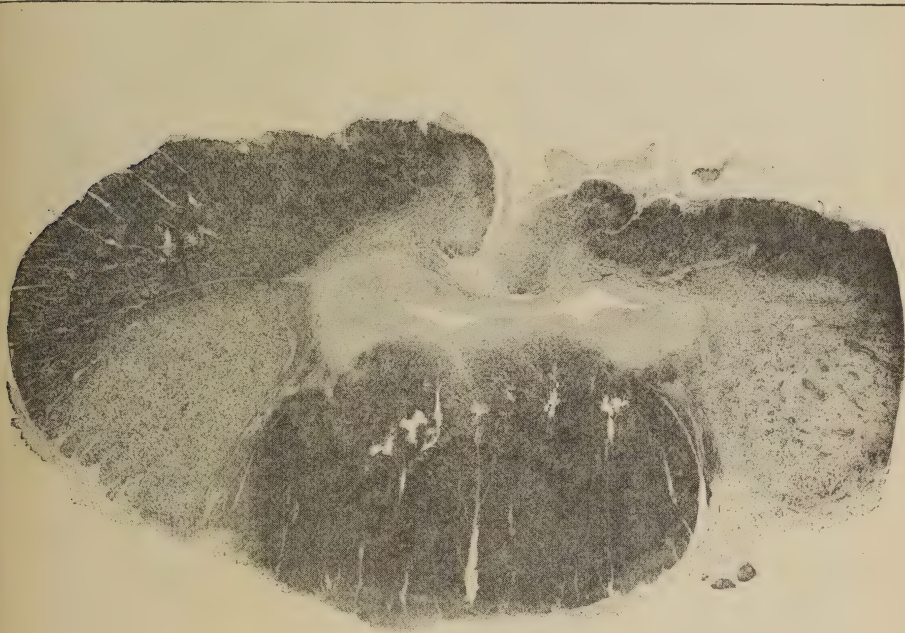
SYRINGOMYELIA.—Cervical enlargement. Cervical region next below Fig. 8. Cavity trends still farther to right. (In this the image is not reversed.) The anterior horn can be well distinguished. It contains more multipolar cells than the former section, but under a high power they are seen to be degenerated. Otherwise the appearances are much the same as in section from which Fig. 8 is taken. The direct pyramidal tract on the right is more degenerated than on the left. The anterior portion, especially, of the columns of Goll are involved in gliomatosis.

cord are the usual seat of cavities, they have been observed in the lumbar enlargement alone.

Position.—The cavity itself always lies in the gray matter primarily. It occupies very frequently the position of the central canal in the perpendymal tissue. It is often observed posterior to the canal in the gray substance forming the posterior commissure, and may extend throughout one or both of the anterior or posterior horns, reaching thus to the very margin of the cord. In such cases the cavity is asymmetrical, lying chiefly in either the right or the left half. The white matter in moderate cases is

unaffected, but where the cavity is large, and pressure from the glioma has become great, the white matter is in its turn involved, being crowded to the periphery and more or less unable to carry on its functions. The anterior columns of the white substance preserve their integrity to the last. We are unable to point to a single case in which these have been affected. Since the defect is originally posterior, it is natural that the columns of

FIG. 10.



SYRINGOMYELIA.—Upper dorsal region. The cavity trends to the right (image not reversed). The gliomatous tissue extends down both posterior horns. All around it the white, as well as gray, matter is degenerated, especially in the direct and crossed pyramidal tracts (more marked in the right). The anterior parts of the posterior columns also are affected. The gray matter is almost entirely destroyed, except the anterior horns, which are seen as mere small projections in front of the cavity. They contain but few cells.

Goll and Burdach should be the first of the white matter to undergo a change. The trophic columns of Clark, at the neck of the posterior roots (gray matter), are also often affected. The initial situation of the glioma is about the central canal, extending thence to Clark's column, and then to the anterior and posterior horns.

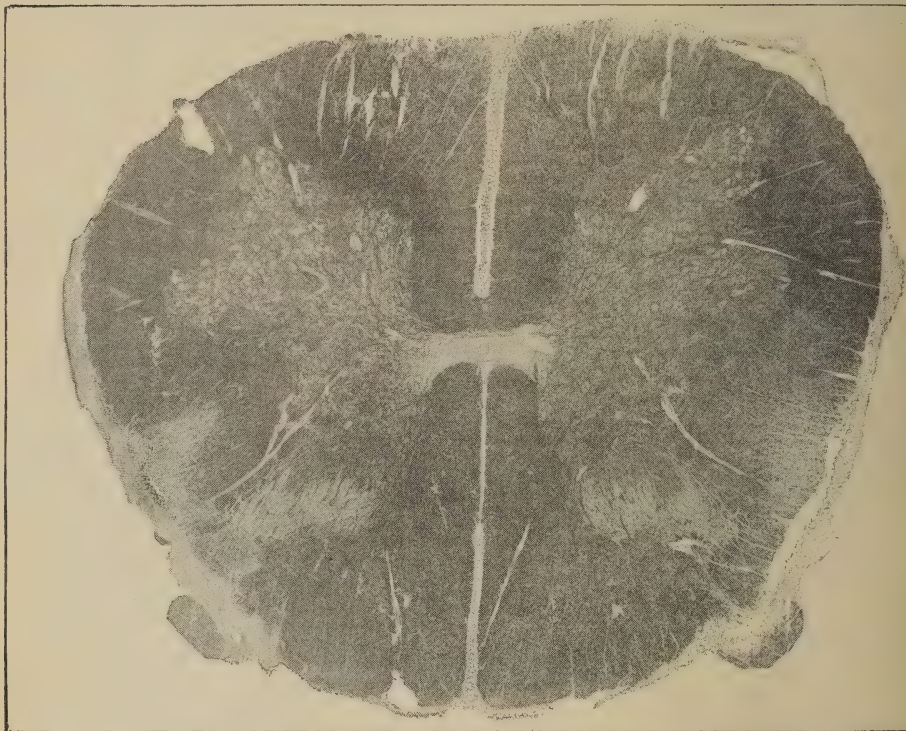
In fifty-six cases where autopsies were made the lesion was located as follows :

CASES (Baumler).

Posterior horns.....	21	Left posterior.....	6
Anterior horns.....	14	Right anterior.....	5
Right posterior.....	5	Left anterior.....	5

The lateral columns, and particularly the pyramidal tracts when involved, as they occasionally are, produce paraplegia. The invasion of the columns of Burdach and Goll gives rise to sensory phenomena, while the degeneration of Clark's column probably is accountable for the trophic changes.

FIG. 11.



SYRINGOMYELIA.—Lumbar enlargement. The cord here presents a striking contrast to its appearance higher up. Its general shape and size, as well as those of its gray matter, are normal. The anterior horns are large and well supplied with motor cells. The posterior horns and root-zones are plainly seen. In but two features does it present very marked abnormal appearances; and these, in view of the diseased state of the cord higher up, are full of interest. First, the lateral, or crossed, pyramidal tracts, which are here small and have come to the periphery, are degenerated. Second, the region of the central canal, in the posterior gray commissure, shows distinctly gliomatous change. Already the central canal is obliterated, but no gliomatous cavity has yet taken the place of the normal one. Dr. Lloyd remarks that this proves very beautifully that the cavity in syringomyelia is *not* a mere expansion of the normal canal. On the contrary, the normal canal does not exist any longer, and its place is taken by the remains of its columnar epithelial cells, which have undergone coagulation necrosis with loss of their characteristic columnar appearance. This group of broken-down cells is surrounded by the gliomatous mass, which at this level occupies but a small space in the gray commissure. We see here, probably, an early stage of the gliomatous process at the lowest point of its downward progression in the cord. Slight degeneration is seen here in the posterior columns near the periphery.

If the new formation give rise to pressure in an extreme degree there may be hemorrhages, inflammation, and evidences of degeneration. In such an event it would be the gray matter of the cord that would show the hemorrhage and inflammation, while the white columns would undergo degeneration. This latter would be, as a rule, ascending, for it is the posterior and lateral columns that are most frequently attacked. Inasmuch as sensory disorders constitute the corner-stone of the diagnosis of syringo-

myelia, it is quite likely that the proportion of cases in which the posterior columns are affected (sixty-two per cent. according to Wichmann) is considerably greater than has been recognized hitherto. In the one hundred and eighteen cases published which we have carefully examined, nine cases, or eight per cent., showed degeneration of the posterior columns, while a larger majority showed sensory changes. It should be remembered, however, that it is possible for syringomyelia to exist without any sensory disorder. In a case of Schlesinger's (VI. Monograph, 1895), there was no anæsthesia of any form, but an autopsy revealed a cavity extending nearly the entire length of the cord. Ascending degeneration was found in Lloyd's case, in which the patient's motor symptoms were more marked on the right side, and the left pyramid degenerated above the cavity.

FIG. 12.



Ascending Degeneration in Syringomyelia. (Medulla Oblongata, Lloyd.)—*Ng*, nucleus funiculi gracilis; *Nc*, nucleus funiculi cuneatus; *F*, funiculus cuneatus; *Sub g*, substantia gelatinosa; *XI*, accessory nerve; *DC*, direct cerebellar tract; *V*, ascending root of fifth nerve; *Ph*, posterior horn; *G*, Gowers' tract; *Ah*, anterior horn; *D*, decussation of pyramids; *Pyr*, left pyramid.

The light, unshaded areas are degenerated. The central canal is surrounded with gliomatous material. The fibres of the accessory nerve are too diagrammatic. They are not so distinct in the section.

The section shown in Fig. 12 was made at about the region of the decussation of the pyramids. The central canal, lined with epithelium, is seen. It is surrounded by gliomatous material, which has not yet begun to break down into a cavity, although under the microscope it is seen to be brittle and friable. The decussating fibres are seen and the remnants of the anterior horns cut off by them, lying to their outer side. It is to be noted that the fibres running towards the right are much more numerous than those running in the opposite direction; also, that the left pyramid is degenerated.

In another case, which recently died in the Philadelphia Hospital (see Fig. 15), ascending degeneration of the pyramidal tracts was found by Der-

cum and Spiller. In this case sections were made from the level of nearly every spinal root and from many spinal ganglia.

By the microscopic examination degeneration of the crossed pyramidal tract was found as high as the substantia reticularis of the second cervical segment and of the direct pyramidal as high as the motor decussation upon the right side, and for a short distance of the crossed pyramidal upon the left. This was believed to be ascending on account of the following facts:

1. Absence of any microscopic lesion above the medulla oblongata.
2. Degeneration of the crossed and direct pyramidal tracts on the same side of the cervical cord, intense in the lower cervical region near the lesion, and diminishing gradually in intensity in the cervical segments, and finally becoming very indistinct in the upper cervical region.
3. Absence of all degeneration in the anterior pyramids.
4. Long duration of a chronic process.

While certain associative fibres may be considered degenerated in these columns, the entire antero-lateral column contains such fibres, and the degeneration was notably in the area occupied by the crossed and the direct pyramidal tract. This ascending sclerosis was probably in greater part due to destruction of motor fibers deprived of their function.

Degeneration of the direct cerebellar tracts and of the tracts of Gowers was traced as far as the inferior peduncles of the cerebellum. Intense pachymeningitis was noticed from the second lumbar segment to the exit of the third dorsal roots. The arthropathy of the right shoulder was not due to any special changes in the cord or spinal ganglia. The posterior roots were not affected even where the pachymeningitis was most intense; the anterior roots at one part of the dorsal cord were degenerated. In the entire cervical region as high as the second cervical segment the cavity was limited to the right posterior horn. The gliosis extended from the extreme end of the conus terminalis to the second cervical segment. The microscopic examination explained satisfactorily the symptoms observed in life.

In this case the disease dated from a strain of the back; three years later there were severe pains in the legs, a band-like pain about the lower part of the chest, weakness in the lower limbs, and a spastic gait. Complete paraplegia with contractures, more marked on the right side, wasting of the lower limbs, paralysis of bladder and rectum developed later. Cutaneous sensibility was lost in the legs and upon the trunk as high as the nipple on the right side and a little above the umbilicus on the left. The sense of temperature was absolutely lost over the right arm, the right shoulder, and the right side of the neck, and also upon the adjacent part of the right side of the trunk above the nipple-line. There was some analgesia of the right arm.

It is only in exceptional cases that pressure is exerted laterally, and, on account of interference with the functions of the crossed pyramidal tracts, that spastic phenomena develop.

Marked atrophy is an indication of excavation of the anterior horns, and

its seat, whether in the upper or lower extremities, is an index of the vertical extent of the lesion. In advanced cases the lesion passes beyond the cervical cord and involves the medulla. This is made evident by difficulties of speech and deglutition, and even mental degeneration and other symptoms of bulbar disease arising from disturbances of innervation of the glossopharyngeal, hypoglossal, pneumogastric, and spinal accessory nerves. When the nerves themselves are affected, we may have the evidences of neuritis.¹

The contents of the cavity vary considerably in color and consistence. In some cases the liquid is clear, analogous to the cerebro-spinal fluid; in other cases it may be described as a hyaline jelly perfectly clear or of a turbid or yellowish-brown hue. It may be bloody, thick, and viscid, or contain gelatinous flakes. It never ruptures outward, as it is not subject to any very great internal pressure.

The walls of the cavity are smooth and glossy as a rule, but in exceptional cases are rough, shreddy and uneven, and of a slightly yellowish color.

The new formation, which is the starting point of syringomyelia, is gliomatous. This may be defined as a neoplastic hyperplasia of the gray matter,—a glioma. It has been called by Cornil and Ranvier a neuroglial sarcoma. According to Joffroy and Achard, Hallopeau and Erckholt, after an inflammatory hyperplasia or myelitis a cavity forms from the retraction of the sclerosed periependymal tissue from the distinctive tendency of the hyperplasia, or may arise from softening consequent on thrombosis of the inflamed vessels. Considerable stress is laid on the vascular origin of the cavity, some authors, such as Langhans, Stadelmann, and Steudener, asserting that the cavity results from periependymal œdema, or from hemorrhage with secondary absorption, or from colloid degeneration of the vessels.

Joffroy and Achard's term, *myélite cavitaire*, is entirely reconcilable with the views held by Simon, Westphal, Roth, Blocq, and Schultze, that the syringomyelia is due to a degeneration of the elements of a neoplasm,—a glioma. The differences of opinion are rather discrepancies of terminology. It may be said briefly that the usual course of arteritis in syphilis and in disseminated sclerosis is towards a diffuse sclerosis and not to cavities. We do not meet with cavities in the system sclerosis. The argument, however, that syringomyelia does not result from a myelitis or a central softening of the cord by endarteritis because we do not meet with syringomyelic cavities in the sclerosis of the cord has been shown by Dr. Byrom Bramwell to be unfounded.

The glioma has its seat in the gray substance, particularly the periependymal region, and affects chiefly the gelatinous substance of Rolando,

¹ See Alexis Thomson's case for neuritis of the suprascapular and circumflex nerves, Edinburgh Hospital Reports, 1894.

which acts as an intercellular cement on the gray matter. It is of a yellowish-brown color and of a rather firm consistence. The latest teaching of the French school is that this mass is the result principally of an agglomeration of large cells, which are more or less crowded together, sending out ramifications which by their interlacing enclose small spaces. The cells themselves form small masses of protoplasm, which are grouped centrally or peripherally, and stain conspicuously the ordinary reagents. The trabeculæ are long and delicate, slightly thickened at certain points. In the net-work of filaments the granular elements are enclosed as well as free cells and fine fibres, together with numerous pigment granules, which give the growth a distinctive color. The reticular tissue is well supplied with capillaries.

The cavity is in most cases lined by a thin membrane, which to the naked eye is glossy and of a yellowish hue. It consists of a delicate membrane of neuroglial tissue composed of branching neuroglia cells of various sizes and with small spheroidal and oval cells embraced in a net-work of fibres. These elements may be either densely packed together or loosely arranged. In other cases the cavity has no limiting membrane or we may have such a membrane present in one portion of the cavity but absent at other portions. The process of liquefaction readily takes place in the limiting membrane. Small holes are sometimes observed in the wall,—spheroidal cavities which have been evidently produced by liquefactive degeneration with disappearance of the neuroglia cells. Van Gieson shows that these changes in the glia-cells are not caused by the action of the hardening agents, since the degenerating cells are not scattered uniformly throughout the cord, but are noticeable wherever there is much hyperplasia of neuroglial tissue.

In a typical case the tumor is composed of closely-packed masses of spindle-shaped and oval cells associated with filaments arranged in strands between and around numerous blood-vessels which are surrounded by a close-textured, sparingly nucleated sheath of neuroglia filaments. The cells, when isolated, comprise glia-cells, together with granular, rounded, or spindle-shaped non-branching cells, resembling the cells of sarcomata. The liquefying product will be found to consist of fluid, fibrin, hæmatogenous pigment, and, in places, of disintegrated tumor cells. Liquefactive degeneration of the glia-cells, gliomatous tumors, constitutes one of the characteristic features of syringomyelia. In a given case we may find obliteration of the central canal; at the same time no gliomatous cavity has taken the place of the normal one. While the canal does not exist, we find in its place the remains of its columnar epithelial cells broken down in a coagulation necrosis with a loss of their characteristic columnar appearance. At other levels the fully-formed cavity will be observed.

It should be borne in mind that not every change visible under the microscope was actually present in life. Irregularities of outline, for example, are very often due to the manipulation of the cord in the process of

removal and subsequent examination. Too much stress should, therefore, not be placed on such distortions. The case of Gyurman has been cited by Van Gieson as one of these examples of artefacts mistaken in some respects for pathological change. Dr. Byrom Bramwell¹ has shown by microscopic sections from two ordinary cases of myelitis that cavity-formation with a surrounding dense membrane does occur, but that specimens of central gliosis from another case, which he very carefully prepared, show that the cavity was formed by breaking down in the process of preparation.

Symptomatology.—The symptomatology of syringomyelia has been placed upon an established basis during only the last fifteen years. Previous to that period the clinical symptoms had not been grouped and classified and given their proper value so as to be of any service to the clinician in recognizing the disease. Its identity, judging it by a series of *post-mortem* records, has been established by a system of *a posteriori* reasoning, so that we are in possession of a definite train of symptoms that have enabled the clinician to declare, in turn, the pathological changes which are present in a given case, particularly if the clinical symptoms are well marked.

These symptoms arrange themselves as follows:

I. Intrinsic symptoms.

1. Symptoms of anterior poliomyelitis, and motor symptoms (atrophy).
2. Symptoms of median poliomyelitis (the central gray substance of the cord).
 - (1) Trophic disorders.
 - (2) Deviations of the spinal column.
 - (3) Vasomotor disturbances.
 - (4) Disorder of the sphincters.
 - (5) Ocular symptoms.
 - (6) Bulbar symptoms.
3. Symptoms of posterior poliomyelitis.

II. Extrinsic symptoms.

1. Sclerosis of the lateral columns. Spastic phenomena.
2. Sclerosis of the posterior columns. Tabetic phenomena.

By means of this convenient classification, which we owe to the late Professor Charcot, we may study the symptoms in order.

I. The intrinsic symptoms are related to the gray substance itself.

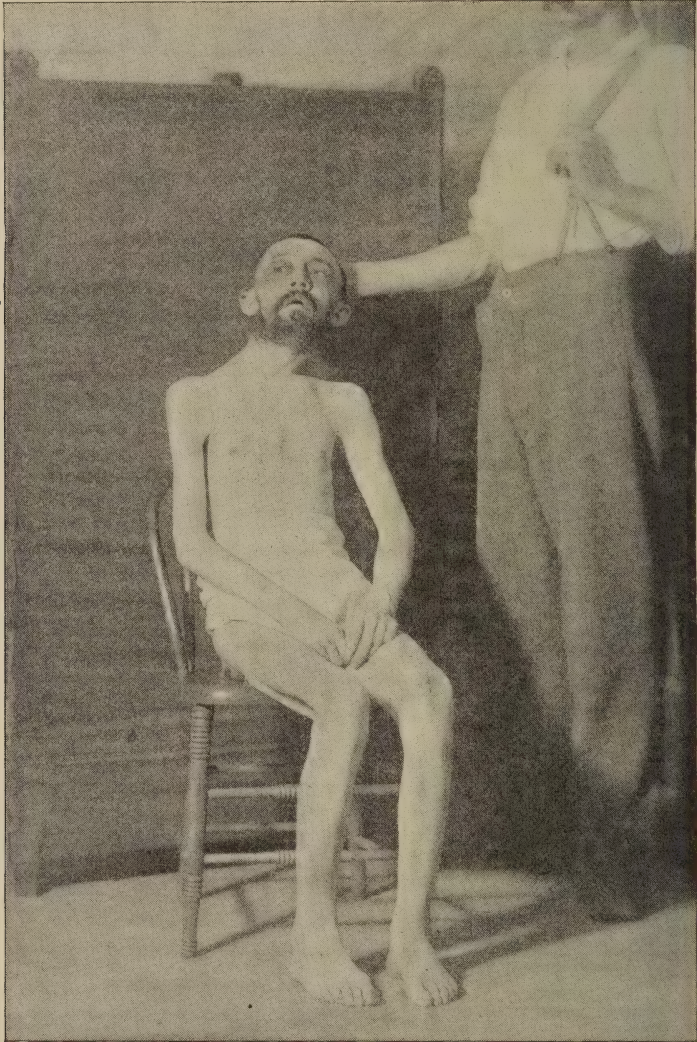
1. Degeneration of the cells of the anterior horns manifests itself by muscular atrophy. This feature of syringomyelia is rarely absent, and is almost as characteristic as disturbance of sensation. Atrophy was one of the first of the clinical symptoms that appeared prominently in a review of those cases in which an autopsy revealed syringomyelia. Indeed, many of these cases had been diagnosticated as progressive muscular atrophy.²

¹ Medico-Chirurgical Transactions, Edinburgh, 1893-94.

² Examples are found in the cases of Gull, Clarke, Beevor, Westphal, Kahler and Pick, Schultze, Dreschfeld, and Schüppel.

The most frequent form of atrophy is of the type Aran-Duchenne. The small muscles of the hand, the interossei, the thenar and hypothenar eminences, appear to be the regions most frequently involved. The atrophy invades the forearm and the arm, the muscles of the shoulder-girdle and trunk, occasionally involving a portion of the tongue, almost always sparing the face.

FIG. 13.



A case of syringomyelia, showing atrophy. (From the Philadelphia Hospital.)

Whether general or unilateral, the atrophy in these cases is always of spinal origin, and by a knowledge of spinal localization we are enabled by the initial motor symptoms and by their progress to determine very closely the seat of lesion. Valuable charts have been prepared and published by Dr. M. Allen Starr and Dr. C. K. Mills as guides in spinal localization.

They have been made from data drawn from studies in comparative anatomy, physiological experiment, and records of spinal-cord diseases, especially from the study of anterior poliomyelitis, transverse myelitis, and syringomyelia.

The muscles of the lower extremity are not involved by any means as frequently as those of the upper limb. Paraplegia is, however, not a rare symptom.¹

The gait is frequently much disturbed. It is slow and in extreme cases so uncertain that it has been mistaken for that of intoxication. Particularly is this the case when the white matter of the cord is affected, where tabetic or spastic symptoms have supervened. If, in addition, the medulla has been involved with consequent thickness of speech it is evident that unfortunate mistakes of this kind would occur. Such have been recorded by Hoffmann, Raichline, F. Taylor, and Haumann.

Electrical Reactions.—The atrophied muscles are prone to undergo quantitative and qualitative changes in their electrical reactions. The opinion is now becoming more common² that the sign of reaction of degeneration has lost much of the diagnostic value which we have for a long time accorded it, inasmuch as it is met with in affections that are purely muscular, as, for example, pseudo-hypertrophic muscular paralysis, and as, on the other hand, we note its absence in nervous amyotrophies of advanced type. In syringomyelia there is great diversity in this respect in different cases. In the one hundred and eighteen cases which we have analyzed the reaction of degeneration in the atrophied muscles was recorded in twenty-one cases. While no doubt many cases were not examined in this regard, we may safely say that R. D. is not found by any means so frequently in syringomyelia as in atrophy consequent on neuritis. It is quite common, however, to find quantitative changes in syringomyelia, there being diminution and sometimes total disappearance of electrical excitability. In one of Müller's cases the muscles presented a normal appearance apparently in no way atrophic, and yet there was very great diminution of faradic and galvanic excitability.

Schlesinger and Frankl Hochwart have called attention to a case which was under treatment by direct applications of the faradic current to the biceps, exhibiting a peculiar undulation in that muscle when stimulated, and which continued to show this phenomenon during the entire course of treatment.

Fibrillary Tremors.—The affected muscles also present another phenomenon,—viz., fibrillary twitching or tremor. True tremors, as observed in paralysis agitans and in hysteria, are not observed in syringomyelia, but we find frequent mention of a frequent and intense fibrillary twitching. In our analysis of one hundred and eighteen cases this feature is mentioned thirty times.

¹ Cases of Westphal, Schultze, Grasset, Chabanne, and Raichline form exceptions.

² See Guinon's remarks in the *Traité de Médecin*, vol. iii., 1894.

2. Symptoms of median poliomyelitis.

This important group of symptoms embraces those which we seem justified in attributing to an alteration of the central gray substance of the cord. The later continental writers, including Bruhl, have adopted the classification which we give below. While in some respects questions may arise as to the localization of some of the symptoms in this group, with our present knowledge we are not able to definitely relegate them elsewhere.

- (1) Trophic disturbances.
- (2) Deviations of the spinal column.
- (3) Vasomotor disorders.
- (4) Affections of the sphincters.
- (5) Oculo-pupillary changes.
- (6) Bulbar symptoms.

(1) The trophic disorders of syringomyelia affect four tissues, viz.,—

- (a) The skin and mucous membranes.
- (b) The subcutaneous cellular tissue.
- (c) The joints.
- (d) The bones.

(a) Trophic alterations of the skin are commonly observed in syringomyelia, and may be of all grades, from a slight glossy condition to extensive necrosis or gangrene. These changes are usually confined to the extremities affecting the atrophied structures, and are prone to occur in the anæsthetic regions: occasionally there is a tendency to hypertrophy of the skin with formation of dense fibrous tissue (Case CXII.).¹ It is common to observe scaling, cracking, and the formation of deep fissures that are the seat of ulcers that become chronic and refuse to heal. These cracks are commonly seated in the palm of the hand, and, although the fissures themselves are frequently painless, the chronic ulcerations are so unsightly that they are often the occasion of the patient's presenting himself for treatment. These cracks furnish a ready pathway for infection, and particularly in syringomyelia of Morvan's type they lead to actual deformity. The accompanying plate from a case of H. Curschmann's illustrates very well this condition. The nails become striated, crack, and suppurate at the matrix. As seen in the plate, some have fallen off, and the remaining stumps with their horny appendages present a repulsive appearance. The resemblance between the observed trophic disorders of the skin and scleroderma are not uncommonly noted by observers. Syringomyelia has been mistaken for pemphigus, on account of the spontaneous bullæ or phlyctenules that are liable to occur on the hands and feet. These phenomena are liable to be persistent, and to give rise to obstinate ulcerations that are difficult to heal, and show a tendency to spread. In a case of Neuberger's there were as many as thirty separate areas of ulceration, of irregular outline and varying

¹ Verhoogen and Vandervelden's case, in which a cavity was found independent of the spinal canal.

size all over the body. Besides this, there were pigmented areas in places, and radiating cicatrices in other situations. In this case there was a syphilitic history, but the autopsy showed a syringomyelia. The mucous membrane of the mouth had been so extensively involved that speech was disturbed, the small vesicles which appeared along the right border and tip

FIG. 14.



Trophic changes in syringomyelia.

of the tongue ruptured and left small ulcerated areas that were extremely painful, and rendered impossible the ingestion of solid food. These patches were at first of circular outline, and covered with a yellowish deposit and surrounded by a reddened areola, but after a time they tended to become confluent. At a later period the left border of the tongue also became affected. In a little while the entire organ became enormously swollen. In the intervals between the paroxysms ulceration sometimes took place in the fissures present. At the time of the attacks there were also pricking sensations in the face. Sometimes the tonsils were swollen and the seat of a yellowish deposit. The condition affecting the mucous membrane of the mouth and pharynx was believed to be pemphigus, non-syphilitic in character. On one occasion an eruption of vesicles was observed upon the extensor aspect of the right hand, and on another occasion a similar eruption on the middle toe of the left foot. Upon post-mortem examination the tongue was found swollen, fissured, and ulcerated. The epiglottis was enlarged and reddened. The entrance to the larynx was closed by intense oedema of the ventricular bands. The mucous membrane

of the larynx was thick and rugous, in places eroded, and here and there, particularly upon the arytenoid cartilages, presenting frothy, yellowish secretions, probably derived from the rupture of pre-existing vesicles. The mucous membrane of the trachea was hyperæmic, swollen, and covered with frothy secretion.

(b) The subcutaneous cellular tissue undergoes well-marked trophic changes. One type of syringomyelia (that of Morvan) is distinguished by painless panaritias, whitlows, or felons. These appearances are usually associated with the palmar cutaneous fissures previously referred to.

There are phlegmons and abscesses, more or less extensive, seated in the arms, the axillæ, and the palms of the hands. Perforating ulcer may also develop. In a case of Le Fort's, in which panaris had existed, and small swellings like boils had appeared on the forearm, shoulder, and abdominal walls, gangrenous areas appeared in the external and upper portion of the left forearm and on the posterior and outer part of the shoulder.

All these trophic lesions of subcutaneous tissues are often serious, if not by their extent, at least by their refusal to heal. They almost always leave behind permanent cicatrices and more or less deformity or mutilation.

Wherever trophic disturbances like panaris occur there is occasionally a subjective sense of cold; in other cases the skin assumes a cyanotic hue or, on the other hand, a diffused redness of the skin with sense of burning. In these cases the surface temperature is sensibly elevated, and a surface thermometer may record from 7° to 9° C. more than when normal areas are tested.

Neuropathic œdema may occur in a generalized manner or localized in a single part, as, for example, in the dorsum of the hand. In one of Verhoogen and Vandervelden's cases (No. 6) there was a cyanotic œdema of the ankles when the patient assumed the erect position.

Roth has described cases with "tumeurs pateuses" which are examples of neuropathic œdema seated in the connective tissue. They presented pitting on pressure and were not associated with any discoloration of the skin.

(c) *Arthropathy*.—Just as in tabes so in syringomyelia, it is not unusual to find affections of the joints. Indeed, they occur rather more frequently than in locomotor ataxia. In our analysis of one hundred and eighteen cases we find arthropathies in thirty-eight or thirty-two per cent. of cases. They may occur spontaneously without trauma, appearing suddenly without accompanying fever or pain. The shoulder- and elbow-joints are favorite sites in this respect, affording a contrast to tabetic arthropathy in which in about seventy-five per cent. of cases we find the lower extremities involved. The syringomyelic arthropathies are usually seated in the upper extremities. It is liable to occur at an early stage, and taken in connection with sensory disturbances constitutes an important and early sign of the disease.

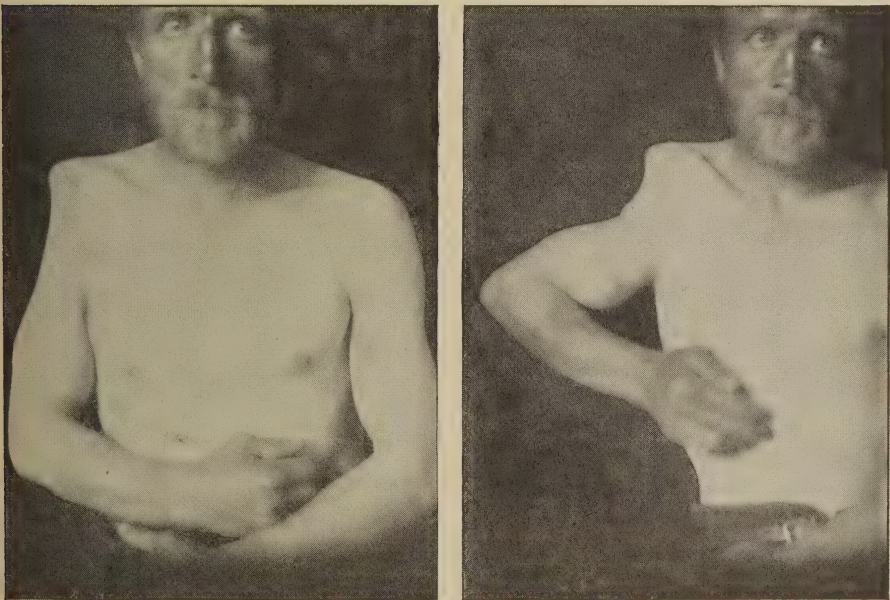
In Schlesinger's ninety-seven cases of syringomyelia with arthropathy we have the following distribution :

SCHLESINGER'S CASES.

Shoulder-joint.....	29
Elbow-joint.....	24
Wrist-joint.....	18
Thumb.....	2
Hip.....	4
Knee.....	7
Ankle.....	7
Jaw.....	4
Sterno-clavicular.....	2
Total.....	97

The arthropathy may consist of a simple hydrarthrosis. The joint swells and leads the patient to consult a surgeon, sometimes, rather than a physician. It is not generally painful, and may become quite aggravated without the patient being aware of it. There may be a subsidence for a time and then an increase of deformity. After swelling of the joint and subsequent disappearance of the fluid the articulation is loosened by re-

FIG. 15.



Arthropathy of the shoulder in syringomyelia. (Alexis Thomson.)

laxation of the ligaments, and it is quite easy to produce luxation. The epiphyses become friable; spontaneous luxation may occur with the growth of enormous osteophytes. Motion at this stage is accompanied by crackling sounds, but the movements are not, as a rule, painful to the patient.

In a characteristic case which had been under observation for years in the Philadelphia Hospital, and studied by Dr. Dercum and others, the right shoulder-joint began to swell, and from rupture of the capsular lig-

ament cellulitis with redness and local heat was produced, but with little or no pain. In extension the humerus assumed the position of a subglenoid luxation. Death was due to exhaustion.

At the autopsy, in 1896, the capsule of the right shoulder-joint was found much thickened and roughened on the inner surface. The head of the humerus had disappeared, the bone having been eroded to some little distance below the surgical neck. A cystic tumor was found in the axilla containing a friable fatty material. The surface of the glenoid cavity was much eroded, roughened, and porous; it was abnormally large, and extensive bony deposits had taken place along its edges. The coracoid process exhibited a thick and firm accretion around its entire edge.¹

Shoulder-joints have even been excised² without the use of an anæsthetic, and in one instance the patient himself occasionally used to evacuate fluid from his elbow with a pair of scissors. A typical case of this kind has been recently published in full by Mons. J. B. Charcot. The patient, a female, aged fifty-seven, had furnished a characteristic picture of syringomyelia, in which the left upper extremity was the seat of the dissociation symptom. The right arm and forearm retained feebly their sensation. Scoliosis and lordosis were marked. In the course of time this patient left the hospital, and three years after the publication of Critzman's account of the case it came again under observation. It transpired that in 1892 she had a fall, first striking the left atrophied shoulder and then the right shoulder, which was the better and which was only slightly disturbed as to sensation. She continued to use her arm, but not so well as before, but at the end of three weeks it had swollen considerably and movement was more difficult. The right shoulder-joint was the seat of an effusion and half a litre of fluid was drawn by aspiration. A luxation received at the time of the fall was then easily reduced, but recurred, and crackling sounds of the joint were noted. The head of the humerus became atrophied and deformed, so much so that dislocation could be produced at will in all directions. Pain had never been very noticeable in this joint; it was present at times, especially under manipulation, but was transient and easily borne. It was particularly the crackling which disturbed and irritated the patient.

(To be continued.)

¹ For description of pathological changes in the spinal cord, see page 627.

² Sokoloff's case and Czerny's case.

CONGENITAL NARROWING OF THE MITRAL ORIFICE
AS A CAUSE OF DWARFED LIVES AND
IRRITABLE HEART.

BY ROLAND G. CURTIN, A.M., M.D., PH.D.,
Philadelphia.

MR. PRESIDENT AND GENTLEMEN,—I wish to bring to your notice a condition of the heart which I think has hitherto been undescribed. The number of cases that I have seen would indicate that it is not a very rare condition, as I have seen about one hundred sufficiently well marked to be recognized. These have been culled from over thirty thousand distinctly medical patients seen in a large dispensary and hospital service, as well as in a private and consulting practice, which includes many heart cases.

While I was serving as chief of the Medical Dispensary of the University of Pennsylvania, in 1877, a young woman presented herself with blue lips and extremities, and was regarded as a case of vasomotor and trophic affection of the fingers. She had the murmur and physical signs, to be hereafter described, in a marked degree.¹

One year later, about Christmas, 1878, three boys presented themselves in a single week at the same dispensary with similar physical signs and symptoms. They were from a prominent city store. They had been acting in the capacity of "cash boys," and the unusual activity, running up stairs, etc., consequent upon the extra hours incident to the holiday shopping, caused them to break down and apply for treatment. In all of them the symptoms were rapid, irritable hearts, suffused faces, shortness of breath, a murmur over the heart, and loss of strength and appetite.

On inquiry, I found that they had previously lived very quiet lives, without active exercise. They were easily fatigued, unable to keep up sustained action, and even in early childhood had been unable to cope with their fellows in active play. They had lived sedentary lives and took only very little exercise.

These cases aroused my curiosity. I have been studying their counterparts with increased interest ever since. I now give you the results of my work. I will read the histories of a few of the cases which best illustrate the early history, symptoms, and physical signs.

CASE I.—*A Marked Case of Dwarfed Life without Irritable Heart.*—E. V., seven years old. Never, from his earliest childhood, had he played

¹ Case reported in the October number of the American Journal of the Medical Sciences for 1878, by Dr. C. K. Mills.

with or like other boys. He never had any marked symptoms until he was fourteen years old. Since then he has grown rapidly. He has had no disease except the usual diseases of childhood. At seventeen he had measles and lung complication.

He is now in college. I asked him whether he played foot-ball. He answered, "That is too rough." I then inquired whether he played base-ball. He said, "That is too active." Next I asked whether he played lawn-tennis, and he replied, "That is too rapid for me." So I finally inquired what he did for amusement. He said, "I play the piano, read, do fancy needle-work, and write poetry." He graduated from college, read law, practised a year and a half, and finally took up office literary work, in which he is eminently successful.

He complains of a pain as if a nail were driven into the sternum opposite the cartilages of the second rib. He complains also of dizziness, and at times loss of memory, and has what is called a "cramped brain," especially on dull days. His growth is good, but he is poorly developed and his muscles are flabby. A marked pulsation at the second upper interspace. The location of murmur one inch above and to the outer side of the nipple, which was on the fourth rib.

CASE II.—*A very Mild Case, with Irritable Heart developed by Strain.*—Wm. L., thirty years old; salesman. While playing ball, at the age of fifteen years, he was running for the "home plate," when he became suddenly weak, and his heart began to palpitate and seemed to be "running away." He stopped and sat down, and in fifteen minutes the heart as suddenly stopped palpitating. The tachycardia has continued during the last fifteen years to return on the slightest provocation, such as coughing spells, active exercise, prolonged work, dyspeptic attacks, cold, etc. Smoking has a bad effect on his heart.

On November 29, 1890, he had an "influenzal cold," with sore throat, soreness of the chest, and some fever and catarrh. He had also palpitation, rapid pulse, pallor, sweating, and frequent vomiting. His heart jumped and fluttered; he had a dull ache at left apex. He has had half a dozen spells of palpitation. Pulse was rapid and heart laboring.

There was a slight pulsation at second left interspace and a vague murmur above left nipple. Dulness on percussion at left apex anteriorly.

CASE III.—S. M., fifty-two years old. Could not run with other boys, and was not strong enough to cope with his playmates. As a child, any exertion brought on shortness of breath and a "hard beating of the heart;" but he could walk all day, and would outwalk those who could run and beat him at other violent exercises. He had night-sweats twenty years ago; a cough for five years; spat blood two years ago. Pulsation at second interspace; murmur at third interspace, which was distinctly heard just above the left nipple.

CASE IV.—E. G., thirty-six years old; married; mother of eight children. Her labors have been easy, without unusual symptoms. Has never

had rheumatism. "She was always a 'quiet child,'" her family said; "always tired after work, and when very much exhausted her lips were blue. She was a chronic dyspeptic."

Last September she had night-sweats. She had a slight hemorrhage last week; presystolic murmur at third interspace in the nipple towards apex of left lung. The apex of the left lung was found to have the following physical signs: resonance, expansion, and vesicular murmur were diminished.

CASE V.—*A very Slight Constriction, with Symptoms of Irritable Heart and Disturbed Circulation, developed by Overwork and Severe Athletic Strain.*—J. T., twenty-five years old, came to me with an irritable heart. He gave the following history:

He worked at the gas-works, and when not employed rowed on the Schuylkill River with a boat club. He began training in a crew for a boat race, but soon "trained off," and applied to me for treatment. I found him with red, turgid skin, blood-shot eyes, general trembling of head and extremities, with hæmoptysis, a rapid heart and respiration. Upon examination, I found a diffused murmur in the usual place over the nipple and an auricular impulse.

After a month's rest all the symptoms and physical signs subsided, to return in a milder form upon active exercise or long-continued labor.

This was not a very marked case, until the unusual and prolonged athletic exercise developed the symptoms which led to the examination of his chest.

CASE VI.—M. E., twenty-six years old. His father had a dwarfed life, and had what was diagnosticated to be a congenital disease of the heart, he manifesting cyanosis when the weather was damp and cold. He died about middle life with exhaustion, cyanosis, and great dyspnœa.

The patient has always played with girls, making "mud-pies," and taking part in other quiet games. He never could stand the racket made by boys.

From earliest childhood exercise has been followed by a thumping of the heart; and if continued after this he would have dyspepsia, a sick headache, and then he would take a long, enforced rest from nervous prostration. He must have nine hours' sleep and a sleep or nap during the day, in order to keep from feeling tired and good-for-nothing.

Four years ago he broke down while preparing for college, and had to stop. I advised him then to go to the sea-shore and lead a quiet, restful life. He is now, after two years, quite fleshy, and has perfect health so long as he leads a quiet, peaceful life.

Murmur above nipple only on exertion now (1896). No auricular impulse, which was present four years ago.

Pulmonary second sound accentuated.

He has had hæmoptysis several times.

Two weeks ago this case came into my office, and I took him to see Pro-

fessor J. M. Da Costa. After a careful examination the latter failed to discover a murmur. I then made the patient go rapidly up and down the office three times. After the exercise Dr. Da Costa readily found a marked murmur in the usual position above the nipple, as indicated in my paper. The murmur was a short, loud whiff with the carotid pulse, seeming to commence and stop with it. Dr. Da Costa said that the case was to him a novel one. He also said that he would consider the murmur a systolic one as to time. There was a pronounced accentuation of the pulmonary sound. There was no pulsation at the second interspace over the auricle, as was found at a previous examination two years before, when his heart was excited.

You will observe that the foregoing cases can be easily grouped into a class, not only by their histories, but also by their symptoms and physical signs. I will call your attention to some of the important points. You will please notice the tendency in some of the cases to lung and pleural trouble of a chronic form, with hæmoptysis and night-sweats. The lesions of the lungs and pleura were generally in the left side. More than one writer has called attention to the comparative frequency of left-sided trouble of the lungs and pleura and hæmoptysis in mitral constrictive disease. In the severer cases the auricular pulsation was decidedly marked. The location of the murmur is so far from the usual point where murmurs are looked for that it might be overlooked. The murmur was almost always absent when the circulation was quiet and there was no consolidation of the lung to transmit it. The point of greatest intensity was above or to the left of the nipple in the third interspace, the time of the murmur pre-systolic or early in the systole. The murmur was not transmitted, being quite localized, except when conveyed by a consolidated lung in contact with the heart wall. The accentuation of the second sound over the pulmonary valves was present to a greater or less extent in almost all the cases, more especially when the heart was excited. The excitement of the heart was brought on by prolonged labor, strain, dyspepsia, fever, influenza, etc.

The patients were never wild, active, romping girls or boys, but quiet and inactive, being easily fatigued. Some shrewd diagnosticians have examined some of these cases and pronounced them free from murmur, even while the heart was excited and the murmur present, having overlooked the murmur on account of its position.

The marked cases have been mostly, about ten to one, boys or growing men. Perhaps this proportion is due to the fact that they are encouraged to greater activity in play or work than are females. I have picked up a number of cases by the casual remark of a mother that one of her children was so quiet, would not play as the others did, but would sit around and read, or engage in some pastime that required no exertion.

One case was that of a young woman, nineteen years old, who nearly died while being delivered of her first child. She suddenly became cyanosed and collapsed. She was only saved by rapidly delivering her with instruments, thus preventing any further bearing-down effects.

Most of the cases applied for treatment on account of symptoms of irritable heart, and the majority of the remainder were recognized by the history of the dwarfed life, and then by active movement developing the murmur. The murmur was almost always inaudible when the heart was quiet, but vigorous exercise would immediately develop it. The murmur was presystolic, or with the first part of the systole, at the top mitral area, or immediately above, or above and to the outer side of the left nipple, and generally associated with an auricular impulse.

In all the cases where the disease was well marked hypertrophy of the left auricle was present, as shown by pulsation in the second left interspace.

The symptoms are those of a laboring heart, emaciation, a dark, muddy or blue complexion, soft muscles, relaxed skin, and a general want of enthusiasm for anything that requires activity, for activity soon begets weakness, dyspnoea, tachycardia, and exhaustion. When exhaustion occurs a long time is required to recuperate the strength.

Post Mortem.—The disease being one that is not fatal, the large proportion of the cases are still living; consequently post mortems have been few. I have had three opportunities of having examinations made after death. All were attended with negative results, so far as the size of the mitral orifice was concerned. The difficulties were that no one was able to state exactly how large the mitral orifice should be in a given-sized heart. One pathologist measured the orifice with his three fingers arranged side by side (000), another placed his three fingers closely together, one on top of the other two (0), and the third one measured it with a cone. All were said to be of (00) normal size. They all exhibited a healthy condition of the endocardium, which would assist in the supposition that they were healthy. Again, the left auricles were all hypertrophied and dilated, which gave the heart the appearance of being larger than normal, while the left ventricles were rather small.

Who can answer the question, How large should the mitral orifice be in the heart of given size or weight?

I do not think that the constriction should be great to produce the symptoms herein described; for, while the blood-current is slow, it is large enough to allow the blood to pass without a murmur, but when the blood runs faster and is in larger bulk the murmur then appears, but during the interval no murmur is discoverable.

Prognosis.—The mild cases are long-lived, unless some accidental disease cuts the patient down, as pneumonia, endocarditis, chronic phthisis, œdema of the lungs from Bright's disease, or some other disease not well borne when accompanied by a crippled circulation.

Strains during the period of active growth are serious, in that the lungs become congested from the stasis produced by the interference of the blood-current. If this is frequent or long-continued, it results in chronic congestion, degeneration, or a sudden airless, œdematous condition of the lung, called by the old writers carnification.

In the young the disease sometimes seems to become milder as development and growth take place, especially about puberty.

If the affection is severe, the patients generally die before middle life; but if it is slight and they are careful, they may live to quite an advanced age with comparative comfort and usefulness.

Treatment.—It is of vital importance that this condition should be recognized early, as by proper advice as to mode of life, occupation, etc., a life may be prolonged and made useful. An active business with long hours will be surely followed by serious results. The orifice being unable to transmit enough blood to supply the body without effort, this effort ultimately wearies or excites the heart.

In addition to this, the blood is backed on the lungs, producing congestion, which, when very marked or when frequent, is followed by chronic degeneration.

All active pursuits and long hours must be interdicted. Direct the business to the capacity of the patient, varying with the degree of the disease. Correct all errors of diet, as an attack of dyspepsia will often bring on an attack of heart excitement. Avoid exposure to cold and dampness. Guard against anger and mental anxiety or excitement. Stop all venereal excesses. Tell them always to live like old people. Banish anything that would be likely to bring on diseases, especially of the heart, lungs, blood, or nervous system. If the heart is excited administer belladonna, assafoetida, the bromides, camphor, valerianate of zinc, or any nervous sedative. The congestive and chronic lung trouble should be treated according to the usual rules.

Overwork or long hours tell on the strength slowly or rapidly, and if the disease is even slight we have a loss of flesh and strength, with occasional palpitation.

If the work is very active, the irritable heart may be the first symptom. When the symptoms are noticed the patient should be *put to bed without electricity and massage*, and should subsequently stay in bed eight or ten hours at night, and in the middle of the day should lie down.

Conclusions as to Lesions.—The reasons for considering it a constriction of the mitral orifice:

1. The chronic congestive lung trouble found associated with this condition.

2. The chronic lung-disease almost always found on the *left* side.

3. The venous stasis and weak arterial circulation.

4. The character of the murmur. It is presystolic, mitral, or with the early part of the first sound.

5. The location of the murmur. It is over the left border of the heart, about the location of the mitral orifice.

6. The loudness of the murmur would indicate that it required the force of the blood-current only found in the left side of the heart.

7. It is a sharp, short, whiffy murmur, which sounds quite near to the chest wall.

8. It is never transmitted, except when the lung is consolidated.

9. The symptoms generally tally with cases having acquired mitral stenosis of a mild character.

10. The hypertrophy of the left auricle, which almost always accompanies mitral obstructive disease.

11. The accentuation of the pulmonary second sound; for, if we have constriction of the mitral orifice, the stopping of the current of the blood, when hurried, dams the blood backward, causing a sudden shutting down of the pulmonary valve and causing the pulmonary second sound to be accentuated.

Reasons for believing that it is congenital:

1. The symptoms all date back to early childhood.

2. It is unassociated with regurgitant disease, which is the most frequent form of heart-disease from endocarditis, and so often associated with mitral constriction.

3. The murmur is generally inaudible when the heart is in a quiescent state.

4. Under a favoring life it does not progress as old inflammatory conditions usually do.

5. It seems to be hereditary,—*e.g.*, a mother and her daughter, two children in the same family, and a father and son.

6. The deficiency of development and growth from early life in most of the extreme cases.

7. On post-mortem examination, in neither case was any change, indicating either present or previous inflammation, found in the endocardium about the valve or orifice.

8. The absence of previous disease that would be likely to produce endocardial inflammation.

In conclusion, I would ask you to test your weak and quiet patients by a rapid run, followed by the application of the ear above and outside of the left nipple, and I am sure that you will sometimes be surprised.

Perhaps some of the evanescent murmurs described by various authors may be of the kind I have presented to you in this paper; for sometimes in lying down the murmur is lost, and on rising it is found.

I am satisfied that if marked cases of the affection under discussion should be called out as soldiers, requiring prolonged, exhausting marches, into any sudden activity, an irritable heart could be produced.

In reading this paper I feel that I am right in my conclusions. If I am wrong, and your interest is attracted to this class of cases and a positive solution is discovered, I will feel that my labor has not been lost. My only query would be, Why should this murmur be so much higher than in the ordinary cases of inflammatory, mitral stenosis, and why should it sometimes occur after the presystolic period?

CASE OF RATTLESNAKE-BITE: RECOVERY AFTER CONTINUOUS APPLICATION OF A TOURNIQUET FOR TWELVE HOURS.

BY WILLIAM W. ASHHURST, M.D.,

Chihuahua, Mexico.

APOLINAR T., Mexican, male, fourteen years of age, was bitten on the right ring-finger by a small rattlesnake at about 7 A.M., July 16, 1896. A few minutes after the occurrence of the accident, some member of the family applied a "Spanish windlass" ligature to the arm just below the axilla. This remained in position about twelve hours, when it was removed by a physician.

The patient was first seen by me on the morning of July 17, more than twenty-four hours after the accident. I found him in a condition of profound depression. Neither the radial nor the axillary pulse of the affected arm could be felt at all, owing to the great swelling of the limb, and the pulse of the left radial artery was so weak that it was almost impossible to count it. The right arm was enormously swollen, and the skin of a brawny consistence. The injured finger did not seem more swollen than the others of the same hand. A shrill systolic murmur was perceptible over the aortic cartilage, probably of hæmic origin.

As the arm was warm, and there was present some feeble capillary circulation in the fingers, I concluded, in order to soothe the intense pain of which the patient complained, to try the effect of a cooling lotion, ordering therefore, locally, lint soaked in lead-water and laudanum, to be renewed every hour, and internally, alcohol, carbonate of ammonium, digitalis, and nux vomica, with liquid diet, and with rest in the recumbent posture strictly enforced.

On account of the length of time that had elapsed since the injury, I deemed it useless to apply any local antidote, believing the poison to be already thoroughly distributed through the arm; and at the same time it seemed most probable that, on account of the feebleness of the circulation in the injured limb, the poison would enter the general circulation very slowly, thereby rendering further application of the tourniquet not only dangerous but useless.

By evening the pulse was stronger, and the patient expressed himself as greatly comforted by the lead-water and laudanum.

The following day, July 18, the patient's general condition had further improved somewhat, but the œdema had spread to the neck and chest.

By July 19 it had extended downward as far as the crest of the ilium

on the right side, completely around the neck, and across the chest as far as the left axilla. The skin was discolored, purple and blackish in patches over the arm, side, chest, and abdomen. At this time the brawniness of the arm was disappearing, and the radial pulse could be felt. The patient was now put upon Basham's mixture and *nux vomica*, and continued to improve.

By July 25 all the swelling and discoloration had disappeared, the heart murmur could no longer be detected, and the patient could use the right hand and arm, although they were still somewhat stiff and painful on motion. He was now allowed to get up and go home, and subsequently reported himself, perfectly recovered, on August 21.

CLINICAL LECTURES.

PARAPLEGIA.

GUNSHOT WOUND OF THE SPINAL CORD.

Bullet located by the Röntgen Ray and subsequently extracted—Obstinate Bed-Sores Relieved by Constant Stay in the Water-Bath for Three Months—Case presented at the Good Samaritan Hospital Clinic, October 6, 1896.

WITH REMARKS BY DRs. WHITTAKER, RANSOHOFF, AND KRAMER.

DR. WHITTAKER.—Gentlemen, I present you to-day a case interesting from many stand-points, but especially as illustrating the difficulty of exactly locating a lesion in the spinal cord and the final success with which the new rays have crowned our efforts. I am sure you are all sufficiently familiar with physiology to know that the spinal cord is probably the *terra incognita* of medicine. A great many experiments have been made upon the lower animals, with the result, however, of obtaining as yet but little positive knowledge; so that we can to-day do little more than appeal to the results of the experiments of Charles Bell, which proved that the anterior horns have to do with motion and the posterior horns with sensation. You will study much concerning the cerebral fibres in the cord, much about fibres originating in the cord, and more about decussating fibres; but there is very little positive knowledge, and exceedingly little that can assist diagnosis. It is really almost as easy to locate with exactness a lesion in the brain as in the spinal cord. But this whole field of obscurity has been suddenly illuminated—so far as the localization of a foreign body is concerned—by the new rays of light.

Let us now hear from the interne the history of the case.

Mrs. L. B. Y., aged twenty-two, married, entered the Good Samaritan Hospital July 2, 1896.

History.—Five weeks ago, in careless manipulation of a pistol she received the discharge in the abdomen in the region of the stomach. The patient immediately sank into collapse, vomited blood, but did not become unconscious. It was noticed at once that all the lower part of the body was paralyzed. The patient had also lost all perception of touch or pain below the stomach. The paralysis involved the bladder and bowels, so that the urine had to be withdrawn by the catheter and the bowels washed out by injections. In the course of a few days bed-sores began to develop on points of pressure, and great pain was experienced in the upper half of the body, radiating towards the back and shoulders. Morphine was administered to relieve this pain, and in such increasing doses as to finally beget a habit, so that the patient at the time of entrance is taking ten to twenty grains per day.

Present Condition.—The patient is a nervous, delicate woman, much emaciated, and showing marked atrophy in the lower half of the body. The cicatrix caused by the entering of the bullet is located in the median line, some inches below the ensiform cartilage. Paraplegia is complete and absolute. No reflex can be obtained anywhere. The skin is white and scaly; it has the appearance of rolled-out uncooked pastry. At all points of pressure, over the sacrum, the trochanters, the knees, and the ankles, large and deep bed-sores have developed. These bed-sores extend in many places to the bone, which is partially denuded, the base being covered by a slough. The edges are livid, not indurated, but in some regions clean cut, as if by a large punch.

Diagnosis.—Gunshot wound of the spinal column with pressure upon the cord.

Treatment.—The bed-sores are treated with europhen paste; the bladder is evacuated by a catheter; cascara is prescribed for the constipation; the patient is put upon a water-bed.

July 13.—A skiagraph was attempted with the X-rays, but failed to locate the foreign body.

July 20.—Another attempt with the X-rays by means of a larger Crookes tube succeeded in locating the bullet or a point near it as a clear space in the body of the eighth dorsal vertebra. The patient shows signs of pyæmia. Quinine and whiskey are to be administered freely.

July 21.—The patient anesthetized was put upon the stomach and face and a long incision made in the lower dorsal region over the spinal column. The arches of the vertebra were divided, and after considerable searching the bullet was found in the eighth dorsal vertebra, embedded in the body of the vertebra, protruding bone into the spinal canal and compressing the spinal cord, which seemed to be considerably broken up. The patient remained very low for a week after the operation, when she began to regain strength. She was during this period stimulated to the limit. The wound healed chiefly by granulation and at no time caused any trouble. The bed-sores, however, persisted.

August 26.—The patient was immersed in a tank of water, which was kept in continual circulation and at a uniform temperature of 90° F. She remained in the tank during the greater part of the twenty-four hours, being removed to a cot for an hour each day. The change effected by this treatment was at once noticed. The appetite began to improve; the general spirits to brighten; the bed-sores to show signs of healing, and the patient to take on flesh and strength, whereupon the quantity of morphine was gradually reduced to four grains in the twenty-four hours.

From our stand-point as clinicians the study of this case is immensely simplified by the history. We are in no wise embarrassed by the etiology.

Ordinarily, the study of disease of the spinal cord is attended with considerable difficulty, but we have here a history of sudden injury to the cord, followed at once by a train of symptoms so characteristic as to leave no doubt of the nature of the lesion.

You have heard in the history of this case that immediately upon the receipt of the injury the patient sank to a state of collapse, that hereupon ensued vomiting, and vomiting of blood. In this collapse the patient was not unconscious, though so sudden and great shock to the cord sometimes extends to the brain and is attended by loss of consciousness. More characteristic is the act of vomiting, which usually sets in after severe damage to the cord ; though you are not to infer from this that the stomach has necessarily been subjected to injury, as the act of vomiting in these cases is often reflex. But according to the statement of the physician who saw her immediately after the accident, the patient vomited blood, and the vomiting of blood, I need not say, is best explained by penetration of the stomach wall itself. So soon as the patient was picked up it was seen that the lower half of the body was paralyzed. There was absolute loss of all motion and sensation below the line of the waist. In other words, there was complete paraplegia.

Paraplegia nearly always follows injury to the spinal cord, but by no means necessarily indicates traumatic injury. Sometimes, indeed, the paraplegia is of cerebral origin, but to produce paralysis of both extremities the injuries in the brain would have to be multiple and located in regions where the cerebral fibres from the two hemispheres come together in transit to the cord,—consequently at the pons or medulla.

There are also cases of toxic origin. I showed you a case here last year of perfect paraplegia which was the result of multiple neuritis. I will have occasion now to show you another case in the wards of absolute paraplegia, with no organic lesion whatever in either the brain or cord, caused simply by hysteria. Most of the cases of paraplegia which we see at this age are due to neoplasms and result from lues. But in none of these cases is the paraplegia sudden. In the great majority of cases a sudden paraplegia is of vascular origin,—that is, it is due to rupture of a vessel, and represents apoplexy of the cord. We say sudden, but even here the paraplegia is a development of some hours. In our case the paraplegia was not merely sudden, it was instantaneous, and, as I have said, we need look no further than the history to find the explanation.

We observe therefore, as stated, total abolition of motion and sensation below the seat of the lesion. All the reflexes are also entirely lost. There is no ankle-clonus, no patellar or abdominal reflex ; nor in all this region is there any perception of touch, temperature, or pain. The action of the bladder and the bowels was entirely arrested. The urine had to be regularly withdrawn by a catheter and the bowels washed out with injections. But this is not all. The vasomotor system suffers and, above all things in this case, trophic changes are most pronounced. The whole body is, as you see,

considerably emaciated, but the wasting is chiefly in the lower extremities, which have become extremely atrophied.

These trophic changes are at present the worst feature of the case, for the arrest of nutrition is so profound that the slightest pressure produces bed-sores; and you observe here over the trochanters, about the sacrum, at the knee, ankle, indeed at any point which has been subjected to the slightest pressure, great bed-sores; these, when the patient first came to us, extended to the bone and presented sloughing masses varying in size from that of an unhulled hickory-nut to that of the palm of the hand. It was really to alleviate this condition that the patient, despairing of any relief from the paralysis, came to us. These bed-sores proved exceedingly refractory to every kind of treatment, yielding in no way, even when the patient was put upon the water-bed. But they were finally brought under control in the water-bath itself. They have now, as you see, filled up to the level of the skin, but there is not yet sufficient vitality to cover the surface over with cutaneous tissue, and we are unable to keep the patient out of the bath long enough to secure the apposition of skin-grafts.

The question of supreme practical importance in this case hinges upon the exact localization of the foreign body. It would seem to be an easy thing to trace up the region of anæsthesia and draw a line at the beginning of sensation. But the process of localization is by no means so simple, for in the first place the distribution of the nerves of the skin is not uniform, and in the second place the patient's perception is not always the same. Thus sensation is apparently perceived higher at certain times than at others. All the text-books furnish tables indicating the paralysis of motion, sensation, and reflex action at the level of different vertebræ. These lesions are, however, better established in the cervical and lumbar than in the dorsal vertebræ. Thus, in the tables of Edinger and Starr, modified by Leyden and Goldscheider, the segment between the second and twelfth dorsal vertebræ is indicated by paralysis of the muscles of the back and abdomen, loss of sensation of the skin of the chest, back, abdomen, and upper gluteal region, and by loss of the epigastric and abdominal reflex. According to Dinkler, the epigastric reflex ceases with injuries on the level of the ninth dorsal vertebra; the middle and lower abdominal reflex, at the level of the tenth and the twelfth dorsal vertebræ. No reflex action is experienced in our case on irritating the skin in the region of the epigastrium, which would indicate that the lesion lies above the ninth dorsal vertebra. We may not, however, specify this localization with exactness, and as it is a point of supreme importance to damage the delicate tissue of the spinal cord as little as possible, you may understand the value of the Röntgen ray which enabled the operator to determine in this instance nearly the exact site of the lesion.

The Röntgen ray has done a good many curious things in medicine; perhaps the most remarkable is the picture of the foetus *in utero*.

Varnier, Chapuis, Chauvel, and Funck-Brentano took a photograph of

an unopened uterus hardened in alcohol at three and one-half months' pregnancy. The picture showed the silhouette of the body of the uterus, the varying thickness of the musculature, and the contours of the embryo. The foetal skeleton could be clearly distinguished. The authors believed also that they were able to declare the sex to have been female.

These experimenters took also a picture of a pregnant guinea-pig immediately after death. The four embryos were distinctly recognized in their various positions, the head of one lying in the pelvis.

But even with the Röntgen-ray illumination we would be unable to appreciate the amount of damage done to the cord. Nor could we so exactly determine this fact even at the time of operation. It was impossible to know to what extent the cord was pulpified or damaged. Sometimes in a complete paraplegia from violent concussion of the cord no damage whatever is found upon autopsy; sometimes not even microscopical examination may disclose a lesion. In these cases the alteration is said to be molecular. Something like this is seen in the demagnetization of iron by a blow. There is no appreciable change, but the magnet has lost its peculiar property and is reduced to an inert metallic mass.

Sometimes, of course, the damage is apparent. The effect of trauma in disorganizing the cord is shown in the experiments of Schmaus, who, after concussion of the cord in rabbits, found granular degeneration of the ganglion cells, swelling and destruction of the axis cylinder, especially of the sheath, and occasional spots of softening. The author considers the changes a direct traumatic necrosis of the axis cylinder, due to molecular change and not to rupture. So in most cases depots of softening and formation of vacuoles have been seen as the result of a *commotio spinalis*.

Serious change takes place in the ganglion-cells of the cord under interruption of the circulation, and the symptoms which show themselves after destruction of the gray matter of the cord are well displayed in the experiments of Münzer and Wiener upon rabbits. These observers found that compression of the abdominal aorta for one hour just below the origin of the renal arteries was followed by permanent motor and sensitive paralysis of the posterior extremities and of the bladder and the bowels, and that this paraplegia was due to necrosis of the cells in the gray substance of the lumbar cord. When the animals were killed at the end of an hour the ganglion-cells showed no visible changes, but at a later period the chromatic substance showed molecular change, in that it was broken up into many fine granules, the cells losing the capacity to take up coloring matter. In from one to two days the ganglion-cells could be distinguished only as outlines, in consequence of the homogeneous alteration of their protoplasm. If the cells of the posterior cornua had not been destroyed the sensation of pain still remained, so that the perception of pain, as we shall see, implies intact posterior horns.

Of course, it was clear that no possible benefit could be secured in this case without the removal of the foreign body, and it was also manifest that

the foreign body could not be readily removed without an exact localization of the lesion. I have already remarked upon the difficulties attending this process. We were fortunate in being able to study the case under the Röntgen-ray illumination, and we were additionally fortunate in having with us, among the younger members of our profession, a *wiszbegieriger Junger*, one of my former pupils, who has devoted a good deal of time to the study of the new rays, and whose scientific attainments well qualified him to utilize them in this case and to explain to you the process so far as it is known. I therefore turned this case bodily over to him, and he will tell you how he was enabled to find and extract the bullet; further, to what measures he had recourse to relieve these bed-sores.

DR. KRAMER.—Gentlemen, the discovery of Professor Röntgen seems to be one of great importance to us.

In opening his paper, Röntgen said, if the discharge from a large Ruhmkorff coil be sent through a vacuum-tube (a Crookes's tube, as it is called), and there be in the neighborhood of this a screen of paper covered with barium cyanide, the tube being covered with dark card-board, certain rays will pass out through the card-board and render the screen luminous. Röntgen further found that if he substituted a photographic plate for the screen the silver was reduced, as when exposed to the solar rays. He further found that certain substances might be introduced between the Crookes tube and the plate and the rays would pass through them, but that certain other substances offered more obstruction to the rays, and thus the shadow of all such impenetrable substances would be produced on the plate.

The current from the Ruhmkorff coil is nothing but a current under enormous pressure, that is capable of overcoming very great resistance. The amount of current in the Ruhmkorff coil is, of course, very small. It is very much like putting a bucket of water in a capillary tube a mile high; you would have very little water, but it would be under enormous pressure. The degree of vacuation in the Crookes tube is unknown: it is said to be the one-millionth of an atmosphere. At any rate, there are but very few molecules of air within the tube. These molecules have plenty of space between them, so that they can readily move. Now, the hypothesis is this: The current escapes under enormous pressure, as all currents do, from the positive pole to the negative. The current carries with it these molecules of air.

When these molecules strike the negative-pole, the latter being placed at an angle, they glance off (the angle of incidence being equal to the angle of reflection), strike the glass wall of the tube, and produce here, as in the coming together of flint and steel, a green fluorescence. Now, all of this was known in the seventies, having been demonstrated by Professor Crookes.

Röntgen's discovery was that in addition to these fluorescent rays there was some other form of energy that differed from the ordinary light rays

in that it could pass through certain substances that were opaque to the solar rays. Of course, theoretically speaking, nothing is absolutely opaque to the Röntgen or X-rays. It is the difference of penetrability that enables us to get a picture. Bones, for instance, are much less penetrable than soft parts. Therefore, if we hold up our hand between the Crookes tube and the fluorescent screen, there is thrown on the screen a shadowy outline of the hand, the difference from the ordinary shadow from obstruction to the solar rays being that the bones are marked as dark shadows, because the light does not penetrate so well through the bone, the flesh being very light.

Now, given such a form of energy which will penetrate the soft parts, it is only the perfection of technique that will determine how much we may do with it. If an energy will penetrate an inch, it will penetrate a mile if there be enough energy. And so the perfection of the Röntgen apparatus has consisted simply in increasing the energy until now we can penetrate most of the cavities of the body.

What is needed is a current of high potential and a proper evacuation in the tube. On account of the dry atmosphere we get in this country a good current of high potential from the old static machine. In Germany I should think they would prefer the Ruhmkorff coil, which is simply an enormous faradic battery.

In the case you have just seen there was, of course, a very difficult problem. It meant that if we were to locate the bullet, we would have to penetrate the entire thoracic cavity. There had been reported at that time (July) by some investigators in Germany similar results through perfected apparatus, but when I first tried it I had very little hope of success. But we finally managed, after taking three negatives, to get a picture. Now, you must not expect too much in the Röntgen photographs; you must remember there is no perspective, no depth. You simply have the distance marked in two directions; there is no third equation. And, besides, they are only shadow-pictures. The farther away a thing is from the plate the more faint will be its outline, and this is the reason it is so difficult to see kidney-stones. Kidney-stones are at least two or three inches away from the plate, and by the time the rays reach the plate they are very much diffused and give quite a washed-out picture. But our ability to overcome this obstacle is only a question of time, more surely so if we are able to refract the X-rays, which up to the present time has not been the case.

In the picture from this case you can see a dark smirch that represents the vertebral column, and on both sides there are dark lines marking the ribs. In the body of the ninth vertebra there is a light spot which is not the picture of the bullet. The picture of the bullet would have been dark like the bone, for lead is quite as impenetrable as bone. So that spot must represent the loss of bone produced by the bullet traversing the body of the vertebra. At that point more rays passed through than through the

rest of the vertebræ, and therefore the picture there is light instead of dark.

This picture, which is much clearer on the negative, as all these are, taken with the position of the wound, the condition of the sensory paralysis, and the history of the case, caused me to feel quite sure that here was the lesion. So, with the consent of the patient and her friends, and with the assistance of Dr. Ransohoff and Dr. Köhler, I removed the vertebral arches of the eighth, ninth, and tenth dorsal vertebræ, and found the bullet embedded in the body of the ninth vertebra, as this light spot indicates. The cord itself, so far as we could see, had not been lacerated, but there were large veins on the pia mater, which indicated it had been subjected to pressure for a considerable time. The bullet and pieces of bone pressing on the cord from the front were removed and the wound was closed. The union was perfect. Recovery from the operation was prompt and complete.

The prognosis I am afraid (although Dr. Ransohoff will say more on that) is not as favorable as it appears. We have endeavored with the water-bath to take away the weight of the patient, and the bed-sores have improved. The rectum has improved so that she has now conscious evacuations. The septicæmia, which was undoubtedly present before, had disappeared; the chills and fever which she had are all gone. Whether we will have regeneration, whether the nerve-fibres will be reformed, is problematic. At any rate, these cases are not to be pronounced fatal too soon. We all of us have seen cases of tuberculosis, for instance, with paraplegia of a year's duration which eventually recovered. I have myself seen cases under Professor Horsley in which he would not give a fatal prognosis under six months.

The surgical aspect of this case will, however, be better discussed by your professor of surgery.

DR. WHITTAKER.—I will now ask my colleague, Professor Ransohoff, who has taken a deep interest in this case and who has favored us with his counsel and assistance, to say to you something of the surgery of injuries to the spinal cord.

DR. RANSOHOFF.—I am sure the gentlemen who have preceded me are to be congratulated, for no case has been more beautifully handled in a scientific and surgical way than this one. There can be no question that the method of examination just outlined is one of the most valuable that can be conceived; yet we must say it is almost the last thing that should be tried. We might almost class it with the exploratory operation, in a surgical way, as a means to be used only after every other resource looking to a correct diagnosis has been tried.

In this case the wound in the ninth dorsal vertebra was very beautifully outlined by the X-ray photograph; yet I am convinced that my colleague and Dr. Kramer came to the conclusion, before the photograph was taken, that the injury in all human probability was in the eighth or ninth dorsal vertebra, neither higher up nor lower down. In many cases we must

reach conclusions without the use of the X-ray, because in many of these cases the X-ray may not be successfully utilized. For instance, in tumors of the spinal cord, the X-ray would not enable us to come to any conclusion as to the site of the tumor, since it would probably be permeable to the X-ray. Yet we know tumors of the spinal cord have been localized accurately without the X-ray. The X-ray, therefore, while of the greatest help in localizing a primary bone lesion secondarily involving the spinal cord, like this, is of uncertain value in diseases of the cord proper. We can come to a very accurate diagnosis without the X-ray. This is fortunate, for in many parts of the country a diagnosis *must* be made without the aid of this highest scientific light.

In the case presented there was a complete paralysis as to muscle, sensation, the rectum, and the bladder. Investigation revealed the fact that from just above the umbilicus downward there was absolute loss of sensation. The respirations were altogether diaphragmatic and intercostal. The abdominal muscles played no rôle whatever in the respiratory act. So we came to the conclusion that, certainly so far as the respiratory muscles supplied from the sixth dorsal vertebra were concerned, the lesion must be below the sixth dorsal vertebra. And since sensation was interfered with from the umbilicus downward, we likewise came to the conclusion that the lesion was between the seventh and the ninth dorsal vertebra. Now, in this case we had further help in determining the site of the injury, from the place where the ball entered; the bullet passed through the epigastrium and then through the stomach, giving the history of the vomiting of blood. This is especially interesting, for how the bullet could pass around the abdominal aorta, the vena cava, and the thoracic duct, in its passage from the epigastrium through the stomach to the spinal column in this region, is very difficult to understand. That the paraplegia was instantaneous, we were told by a practitioner who saw the patient at the time. This almost invariably means a fracture of the body of a vertebra,—either one which destroys the cord by cutting it in two, which is very rare, indeed, or one that presses upon the cord and pulpifies it. There are other possibilities for the production of paraplegia. We might have a paralysis coming on gradually in consequence of pressure on the cord, of hemorrhage, or inflammatory exudates. In fractures, as a rule, the damage done is instantaneous, and that is precisely what was found in this case.

At the time of the operation, we found the bullet embedded in the vertebral body without projecting into the vertebral canal. It had raised in front of it fragments of bone, which pressed against the membranes of the cord and pulpified the latter within the membranes. This is what is almost invariably found in injuries of the spinal cord, whether they are the result of gunshot wounds or of trauma received in other ways. Almost invariably fragments are found which have not cleanly divided the cord, but have pulpified it.

We found here the loss of reflexes to which your attention has been

called by Professor Whittaker. Whenever we have complete paraplegia with loss of the deep reflexes, it means, almost invariably, if not a cutting across of the cord, such as would be made in physiological experiment, which is very rare, indeed, at least a pulpification that is almost equal to a complete cutting across. That is the reason why so many surgical operations done upon the cord for the relief of pressure and fracture have failed to give good results. Pott's disease has been alluded to as causing paraplegia. This form of paraplegia very rarely comes on suddenly. Such a paraplegia is almost invariably of gradual development. The cord in such cases is merely pressed upon and not as by a fragment. We have a thickening of the membrane and the fibres of the cord are displaced in their relations to each other, and when the thickened mass of membrane is removed, the spinal cord very soon regains its proper anatomical relations, and therefore its normal physiological functions. The paraplegia of Pott's disease is often recovered from without surgical interference of any kind.

And yet in every case of fracture of the spine with such complete paraplegia there is only one hope for the patient, and that is operative relief. But I have never seen a case of fracture here recover: the higher the fracture, the more speedily fatal will be the termination.

The patient may possibly live for months or for one or two years when the cord has been injured to this extent, but eventually these patients die. When only the fibres of the cauda equina are injured, the prognosis, of course, is very much better. But the clinical phenomena presented by this patient, the bed-sores, pain, convulsive movements, morphine habit, make it certain that the patient would have died had nothing been done,—and there was only one thing to do, and that was to operate. This is not a new procedure: it has been adopted time and again in the hope of finding only pressure, without disintegration of the cord. Before the advent of antiseptic surgery the mortality was frightful, seventy or eighty per cent. of the patients dying, within a week at most after operation, from septic infection. Since the days of aseptic surgery the operation has been followed by very much greater success, so far as danger to life is concerned. The mortality has been reduced to about thirty-eight per cent., which is entirely due to the fact that infective diseases have been largely excluded, hence the patients do not die in a week or ten days from upward extension of inflammation of the membranes. Still thirty-eight per cent. of the cases do die soon after operation, even under our modern methods of operating, and they die as they would die if the operation were not performed.

Not long ago I saw a patient in Illinois, upon whom a tree had fallen. Within forty-eight hours the patient had very deep bed-sores. He was nearly exhausted from using his diaphragm alone in breathing. The conditions were not such as to warrant operation, for this is not an operation to be undertaken in every case. The patient died within forty-eight hours after I saw him. I did not operate upon him; he would have died any way, and the death might have been ascribed to the operation.

But the only chance for the patient presented to you here to-day was in operation,—not a very brilliant one, it is true; it was, however, the only chance the patient had, and she certainly was entitled to it. The opening up of the spinal column is a very difficult procedure. You have seen it in the dead-room. Very few pathologists are fond of opening up the spinal canal. The operation is made difficult because of the depth at which the laminae of the spine are placed and on account of the extreme hardness of the bone. The incision must be made much longer than is necessary for ordinary operative procedures. The muscles must be severed from the spine and held aside by retractors. Then with heavy forceps the spinous processes are removed. After that is completed, with bone-cutting forceps or saw (one usually uses one instrument after another) the laminae are cut through first on one side and then on another, removing completely the arch of the vertebra. This sounds easy, and would be easy if it were not for the fact that we have veins in the spinal canal that are very thin-walled and difficult to see, and that bleed very freely. We have one, for instance, on either side of the middle line. After the pressure is removed from within the spinal canal, these veins have a distinct tendency to bleed. But with hot water, pressure, and a ligature here and there, it is possible to control this hemorrhage and expose the membranes. Then it is easy to introduce a third retractor and bring the cord over to one side and find the bullet. First, however, in this case, we could feel through the cord the hardness produced by the bony fragments which the bullet had displaced.

This patient has done admirably. Yet I am afraid, with Dr. Kramer, that the case will not progress as it would were all things in this world as they should be. The question is whether the bed-sores are better from changes in the cord or from the water-bath. I am inclined to think the latter is the case. When changes take place in the cord for the better, they usually come on with considerable rapidity. Had the damage in this case been only from compression, we should have had better results than have thus far been achieved. The rectum is better, the bladder remains unchanged, the reflexes have not returned. We must, therefore, come to the belief that, although some little improvement seems to have taken place, further advance must be more a hope than an expectation. In every case of fracture of the spine, having first clearly put before the patient the chances of recovery with operation and without, if you can gain the consent of the patient, by all means operate. Without operation the prospect of recovery is remote; with it some hope is offered. But let us trust, not only for the sake of the patient but for the light of the profession, that the results in this case will not be as dubious as we now believe.

DR. WHITTAKER.—Let us, now that the patient is transferred to her room, study the case as physicians from the stand-point of the chief symptoms which are shown,—to wit, the loss of motion, of sensation, the abolition of the reflexes, the pain, the spasmodic contractions, the interference with the action of the bladder and bowels, and the vasomotor and trophic

disturbances. And in this study let me say something of the new doctrines concerning the physiology of the cord.

We know, from the studies of Bell, that the anterior cornua have to do with motion and the posterior with sensation. This much is positive knowledge. Experiments upon the lower animals teach us also that the motor and sensory fibres run a separate course for a time; the motor through the anterior, and the sensory through the posterior parts of the cord, so that the anterior gray substance has to do chiefly with motion and the posterior gray substance chiefly with sensation. Here come in now, however, other fibres, centrifugal and centripetal, which, almost unintelligibly, certainly contradictorily, complicate our knowledge of the functions of the cord.

It was ascertained from the experiments of Schiff that division of the whole cord, with the exception of the posterior columns, abolishes the sense of pain,—that is, produces the condition which is distinguished as analgesia. But if the smallest portion of the posterior gray substance is left, it will suffice to conduct sensation of pain, though the conduction will be somewhat retarded. That peculiar disease of the spinal cord marked by the formation of cavities, and hence known as syringomyelia, is distinguished by paræsthesia, but especially by diminution or loss of sensation to pain and heat, so that burns are not felt, or are discovered only by the destruction of tissue. But the sensation of touch and the muscular sensation are usually unaffected. Trophic changes are, however, very common. The surface becomes cold and cyanotic, and the patient succumbs to bed-sores, cystitis, and marasmus. This is a good deal like the picture which is shown in our case, and the condition would indicate most serious damage to the gray matter of the cord.

May we determine if only one half of the cord is hurt?

Brown-Séquard long ago observed that section of the lateral half of the cord in the cervical region was attended on the same side by paralysis of voluntary motion and of the muscle-sense, as well as of the vaso-motors, as indicated by the higher temperature of the skin; also by an increased sensitiveness to touch and temperature of the trunk and extremities,—that is, by hyperæsthesia; and on the opposite side by anæsthesia of both the extremities, and by the abolition of all varieties of sensation except the muscle-sense, while motion was preserved intact. We have here no hyperæsthesia and no conservation of muscle-sense.

Conduction of the muscle-sense would seem to take place in the posterior columns, as disease of these columns—*e.g.*, locomotor ataxia—or any interruption of continuity leads to disturbance of co-ordination.

The lax and flabby condition of all the muscles below the line of lesion shows the loss of muscle-tone in our case. This muscle-tone has heretofore been regarded as a kind of excitation arising automatically in the spinal cord and keeping the muscles in a state of partial contraction. This view, however, has been entirely abandoned in our day as untenable. No such

force ever develops spontaneously in the cord. All nerve force is now known to be the result of extraneous impression, so that the muscle-tension is better explained as a reflex tone conveyed through the motor nerves in response to stimulus from the sensitive nerves. The stimulus for this action is found in the continuous impression of outside influences, touch, temperature, sustentation of weight, as of parts of the body, circulation, etc. These impressions received upon the surface of the body or through sensitive regions act in a reflex way in securing that light tension of muscle which is known as muscle-tone, and the muscle-tone itself is a direct expression of the influence of the sensitive upon the motor nerves, or we might say of the posterior upon the anterior roots.

For the same reasons we are led to believe that the sensation of touch is probably also located in the posterior columns, while that of temperature, as stated, is chiefly conducted through the gray matter. Herzen went so far as to claim as a result of his experiments and clinical observations that the sensation of cold was conducted through the posterior columns and that of heat through the gray matter, but these conclusions have not yet been verified. The vasomotor nerves run in the anterior columns, which they leave to penetrate the gray matter, and thence issue through the anterior roots and the communicating branches to enter the sympathetic nerve. These nerves are certainly centrifugal, as the blood-vessels are paralyzed below the line of section, while stimulation of the distal portion leads to contraction of the vessels. Stricker claims that vaso-dilators run in the posterior cornua. The course of the secretory and trophic nerves, if such exist separately, is entirely unknown.

You have heard so much of reflex action as, perhaps, to have been led to believe that the course of a sensitive nerve has been directly traced to a ganglion in connection with the motor nerve. But while such a communication has been assumed, it has never been actually demonstrated. The simplest reflexes complete their arch in the same section of the cord, and Gad has shown that contralateral contraction, what is known as the crossed reflex, may occur in the same short segment of cord-tissue. The simplest reflexes are seen in the so-called patellar and plantar reflexes. The most interesting of these are the crossed reflexes, in which a stroke, for instance upon one knee, brings out a more marked contraction in the opposite leg, while it may show little or no response in the knee which receives the blow. This condition is seen in hemiplegia and after injury of the cord, and is dependent upon the different excitability of the reflex centres of the two sides.

The total abolition of the reflexes upon both sides in our case is a fact of very serious import. Bastian reported four cases of total destruction to the upper dorsal portion of the cord in which the reflexes were entirely lost. Bruns reported also such a case in which the subsequent post-mortem showed the integrity of the lumbar region of the cord. Now, as the lesion of the cord in these cases is above the centre of the patellar reflex, which

lies in the upper portion of the lumbar enlargement, the abolition of reflex action can be explained only by inhibition. The reflexes are inhibited in various ways, but especially by interruption of the course of the fibres from the brain. Setschenow removed the cerebral hemispheres in a frog, irritated the optic lobes by crystals of common salt, and thereafter found marked retardation of the reflex action. But extreme irritation of any part of the nervous system may have the same effect. Sherrington found that irritation of the sciatic nerve inhibited the patellar reflex.

The doctrine so long undisputed, that section of the cord above a reflex arch increased reflexes of the lower part of the body, has been combated recently by Bastian, Bowlby, and Bruns, who showed that entire cross section destroyed the reflex below it, and that the former view depended upon the fact that the cross section was imperfect, for it is claimed that reflex activity of the cord persists only when a certain amount of excitation passes from the cerebellum to the cells of the anterior cornua. This view, however, is not entirely unassailable, for it is observed in cases of decapitation that the reflexes persist for perhaps a minute after execution.

May we learn anything of the extent of the damage in our case by the electrical reactions?

A few muscles in the legs, notably the adductors, show in our case only the feeblest reaction to the faradic current. It is difficult to determine the reaction of degeneration. If there is any response to the galvanic current it is exceedingly feeble. The galvanic current should excite prompt response, but the action here is so feeble as to be hardly recognized.

In order to show a perfect reaction of degeneration the muscles should respond not to the faradic but to the galvanic current, at first excessively and later less and less, until, finally, there is no response at all. In the partial reaction the muscle is feebly excitable by the faradic current. There are no fibrillary twitchings, but there are occasional spontaneous contractions which move the legs.

The study of the condition of the nerves and the action of the muscles is rendered additionally difficult in our case by the fact that the patient suffers so much pain as to necessitate the use of morphine. Just how much pain the patient experiences is difficult to say. There is no sensation whatever in the lower half of the body, and no pain is felt in this region, but severe pain is complained of in the upper half, especially in the shoulders, and it was to relieve this pain that the patient has been obliged to use morphine in constantly increasing doses, so that now the opium habit is superadded to the symptomatology.

There is a form of paraplegia known as paraplegia dolorosa, which is marked by extreme pain in the back and in the paralyzed members. This condition is usually due to progressive compression, and is seen most frequently in cancer of the spinal column.

The evils of damage to the cord do not always show themselves at once. Gowers divides his cases of this type into three classes: 1, those in

which the injury causes immediate and severe paralysis due to instant damage to the spinal cord ; 2, those in which there are at first either no symptoms or only trifling disturbance, but in which grave symptoms set in after a few days or weeks ; 3, those in which there are no early symptoms, but symptoms set in in the course of one or several months. In one remarkable case reported by Grawitz, the signs of compression of the cord did not develop until two years after the initial lesion. During the next two years the symptoms improved ; at the end of that time the patient succumbed to miliary tuberculosis. The cord showed secondary degeneration, with fresh softening at the point of compression, probably in consequence of the tuberculous arachnitis.

The difficulty with the bladder and bowels in our case has largely subsided, notwithstanding the persistence of the paraplegia, so that the bladder now empties itself and the bowels are sometimes evacuated spontaneously ; indeed, of late there has been an occasional tendency to diarrhœa. It is needless to state that this voluntary movement of the bladder and bowels, like the spontaneous movements of the legs, is due to reflex action, which asserts itself in its own centres in the cord below the seat of the lesion.

It is astonishing what pressure the cord may endure under gradual tolerance. Grawitz reported the case of a soldier who continued on duty up to eight days before death, notwithstanding an extensive softening from caries of the vertebra. This disease sheds some light upon our case, because caries of the vertebra, while it may occur at any portion of the spinal column, shows itself most frequently in the lower dorsal vertebræ.

The degree of accommodation or compensation which may be accomplished at times is almost incredible. Thus Joachimsthal reported in Virchow's *Archives* last year the case of a man, aged twenty-nine, who suffered from complete paraplegia, but who—it seems almost incredible to relate—"was able to stand, to walk, to climb, and even to jump, and in such a perfect manner as to be able to appear before the public as an artist." Long practice had developed to real Herculean proportions the muscles of his body, shoulders, and arms,—else was he able only to move with two crutches. Both the bones of the forearm were enormously enlarged. Something like this is seen in congenital defect of the tibia, where the fibula in assuming the rôle of the absent bone becomes extraordinarily thickened.

The most desperate cases may not be despaired of. In one case, also reported by Grawitz, the symptoms of compression from tuberculous spondylitis in connection with gangrenous decubitus and thrombus of the right and left femoral vein, all gradually disappeared.

Considering all the facts now in our case, with full appreciation of the immediate danger of death by decubitus, that is by sepsis, by cystitis, marasmus, inanition, and with definite knowledge of the extent of the damage done to the cord, what may be the hope of improvement from possible regeneration of the nerve-tissue?

The possibility of regeneration of nerve-tissue in the cord seems to be decided rather in the negative. Ströbe found that after injury to the cord, cicatricial tissue developed from the granulation-tissue at the borders of the wound in forty-five days. Young, newly-formed fibres originated from the posterior roots and projected themselves into the cicatrix. These fibres had the characteristics of young fibres,—that is, they showed light varicose swellings, undulatory serpentine course, with the formation of a net-work whose elements were spun round each other in irregular spirals. The young fibres were provided with a distinct sheath. Besides, fine fibres were developed from the white substance of the cord in individual regions; these fibres penetrated the zone of degeneration and could be followed into the cicatrix, where they were lost. These fibres also showed the characteristics of young nerve-fibres, as they took their course between the cells of the cicatricial tissue. It seemed as though they originated from the old fibres which had been divided. But it was clear that the formation of these fibres was limited to a very narrow region. It seemed as though there was an attempt at regeneration, but there was no real new formation, nor real regeneration of nerve-tissue. The nuclei of the connective tissue were somewhat increased from the second week on, but proliferation of the glia was still very slight even as late as forty-five days. Typical mitosis was very rarely seen; this is in correspondence with the slow increase of tissue. Moreover, typical granular cells were extremely rare in the field of secondary degeneration. So it seemed to be decided that the glia was not able to fill out any great defects such as result from sections or centres of softening. These defects are either repaired by a cicatricial tissue or, in case of great loss of substance, by a membrane of connective tissue at the border surrounding a permanent cavity.

The observations which would seem to indicate the possibility of regeneration were made in the lowest animals, and even here the results obtained are not accepted without dispute. For instance, in the case of the lizard there is restored after the amputation of the tail not only a new tail, but also that part of the spinal cord which had been lost; but it has not been demonstrated that the restoration of the cord is attended with real restoration of function (Müller). Sgobbo claimed that a section of the dorsal cord of the triton was followed by evidence of degeneration originating in the epithelium of the central canal. Leyden and Goldscheider quote from Massius and Vanlair the observation that the interspace caused by the removal of a piece of the spinal cord of a frog, one to two millimetres in length, was filled in the course of a few months with a yellow gelatinous mass in which could be traced cells and fibres, which the authors believed themselves justified in regarding as ganglion-cells and Remak fibres. They observed also an apparent restoration of function in a certain degree, but anything like an exact conclusion could not be drawn, from the fact that the lower part of the cord is the centre of so many reflex motions, many of which simulate voluntary motions. Goltz and Frensborg showed how varied, com-

plicated, and apparently voluntary are these reflex motions in the dog. Voit, as well as Deval and Laborde, observed in the skull of a pigeon after removal of the brain a remarkable new formation of matter much like nerve substance. Brown-Séquard observed restoration of voluntary motion in certain degree after entire cross section of the cord. In these cases the divided ends of the cord had united, and ganglion-cells and nerve-fibres were found in the scar. But Sgobbo was not able to confirm these results; the functional restoration was only apparent, and this was caused by reflex action. A number of the best observers have seen restoration of function in the dog after half section of the cord without the development of new fibres in the cicatrix, the function, of course, being performed, therefore, by fibres in the other half of the cord. But equally good observers still maintain that cross section of the cord in the dog and other animals was followed neither by functional restoration nor by the formation of new nervous elements in the cicatrix. Marinesco, in his experiments upon the brain, saw karyokinesis in certain ganglion-cells, but never anything like a real proliferation. The cases, therefore, of improvement and apparent restoration of function after hemorrhage, compression, and other damage are probably to be referred to disappearance of œdema, relief of pressure, absorption of effused blood, compensation by other nerve-fibres, etc., and are not due to regeneration. We must conclude, therefore, with Leyden and Goldscheider that experiments only lend support to the melancholy fact that we know as yet no sure signs which would indicate the possibility of a regeneration of the spinal cord.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

A Case of Thrombosis of the Abdominal Aorta. (*British Medical Journal*, October 24, 1896.) By Walter Bell, M.D.

The patient's wife had been treated for syphilis, but he himself, an apparently healthy man of thirty years, gave no history of any previous disease. The condition commenced suddenly with intense pain in the back and abdomen, the legs became powerless, and the patient fell to the ground, but did

not lose consciousness. He was admitted to the hospital in a state of severe shock, the lower extremities were absolutely paralyzed, and there was anaesthesia and analgesia extending upward as far as the lower third of the thigh, above which point there was a zone of hyperaesthesia two inches broad. Over the rest of the body cutaneous sensibility appeared to be normal. The reflexes of the lower part of the body were abolished. There was severe pain in the lumbar region and in the thighs and legs. The patient rapidly became worse, control over the bladder and sphincter ani was lost, and the lower extremities were deadly cold and quite pulseless. The kidneys apparently soon ceased to functionate, for only small quantities of very fetid urine could be obtained by the catheter. There was severe delirium and subnormal temperature. Gangrene commenced in the right calf and the scrotum, and the breath had a gangrenous odor. Death occurred fifty-six hours from the onset. A partial autopsy only was allowed. The lumbar enlargement of the cord appeared to be normal and was so reported, after microscopical examination by the Clinical Research Association. In the aorta a firm white fibrous thrombus was found, totally occluding its lumen, and extending from the inferior mesenteric artery to the bifurcation, a distance of about one and three-quarters inches, and for about an inch into either common iliac. [It is impossible to believe, in view of the results of experimental ligation of the aorta by Nissl and others, that an adequate examination was made of the portion of cord excised: some of the symptoms seem to indicate degeneration of the ganglion-cells. Unfortunately the obstinacy and ignorance of the relatives prevented a more thorough study of the various changes.]

Concerning the Amount of Nitrogen or Albumin contained in the Sputum in Various Diseases of the Lungs and the resulting Loss of Nitrogen to the Organism. (*Deutsche Archiv für klinische Medicin*, March, 1896.) By Dr. Friedrich Lanz.

The author endeavors to answer the following questions: Is the amount of nitrogen in the sputum different in different diseases of the lungs? Does it vary in different stages of the same disease? Is it sufficient to affect and change the tissue metabolism? The method employed was to make two nitrogen estimations according to the method of Kjeldahl, the ratio of nitrogen to albumin being taken as 1 to 6.25. In sixteen cases of pulmonary tuberculosis the minimum percentage of nitrogen was found to be 0.2698 per cent., and the maximum 1.1459 per cent., the mean of thirty-six estimations being 0.6795 per cent., corresponding, when reckoned in connection with the daily amount of sputum, to an average daily loss of 4.1306 grammes of albumin, a quantity not to be neglected when it is considered that it occurs daily for long periods.

Three cases of pyopneumothorax showed considerable variation according to the nature of the condition. Two of these were tubercular in nature, and in both the amount of albumin lost was considerable, exceeding 13.5

grammes per day. In the third, non-tubercular, it was only 4.25 grammes per day. In four cases of pulmonary gangrene following pneumonia considerable difference was found according as the amount of sputum was profuse or not; but Lanz is inclined to believe that the percentage of nitrogen in the sputum is in reality small, the larger proportion of proteid matter being due to fragments of tissue. In pneumonia, on the other hand, the amount of nitrogen was excessive, reaching at times more than 1.5 per cent., and corresponding to a loss of five or six grammes of albumin per day; a quantity not of itself serious in an acute disease, but important to take into consideration in analyses of tissue change. In a number of cases of bronchitis the amount of nitrogen was found to be very variable, bearing, however, some relation to the severity and extent of the process, and in long-continued cases unquestionably causing injury to the patient.

A Case of Subphrenic Pneumothorax. (*British Medical Journal*, October 24, 1896.) By F. Nicholson, M.D.

The patient, formerly a soldier in the Indian service with a history of dysentery, had suffered for about a year with a dull aching pain in the lower part of the right chest. The percussion note over the right chest anteriorly was high pitched and tympanitic, but good vesicular breathing was heard everywhere. The area of hepatic dulness was greatly diminished in its upper part, and measured only an inch in the mammary line, and there was marked tenderness in the region of the gall-bladder. In all other respects the physical examination was negative. Later it was found that the bell sound was limited to the right chest anteriorly, and that a succussion splash could be heard anteriorly and posteriorly below the nipple line. When the patient was made to sit up, the area of hepatic dulness increased to three inches in the nipple line. A diagnosis of subdiaphragmatic abscess containing gas was made, and subsequently confirmed by an operation.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

A Discussion on the Treatment of Cardiac Failure. (*British Medical Journal*, September 19, 1896.)

Sir T. Grainger Stewart, M.D., F.R.C.P.E., opened the discussion on this subject at the Sixty-fourth Annual Meeting of the British Medical Association. Among all the agents at our disposal the most important is rest. It is rest from laboring work that tells most favorably; and, although rest is good for all heart cases, it is much more effective in these cases than

in any others; for by the time a man who leads a comparatively easy life begins to exhibit the general symptoms of cardiac failure his cardiac muscle is, as a rule, so much deteriorated as to be less capable of a rally than that of the laboring man exhibiting corresponding symptoms. Second in importance is the element of hope. Next to rest and hope diet should be placed. Some cardiac patients benefit by an increased allowance of nourishment; some by a diminution of the amount; and many by an alteration of its quality. Along with diet it is necessary to consider the use of alcohol as a substance for habitual consumption.

1. Any excess, even habitual slight excess, is to be strongly deprecated in all cases of threatening cardiac debility.

2. Its use in any form which is unsuitable to the stomach, giving rise to dyspepsia and secondarily disturbing the heart's action, must, of course, be forbidden.

3. Its employment in moderate doses is of great service in cases of cardiac debility, and especially in such debility as we have seen of late years following influenza or diphtheria or any other acute exhausting disease, as well as in the advancing cardiac weakness so common in later life. The best form of alcohol is, in the majority of cases, whiskey, and the dose may vary from two drachms to two ounces. The amount for habitual use should never exceed four ounces in twenty-four hours. It should always be taken with food, and, if apart from the ordinary meals, should be mixed with milk or milk beaten up with white of egg.

Passive exercises resulted:

1. In the great majority of cases of cardiac dilatation, in diminishing the area of cardiac dulness perceptibly during each administration of massage.

2. In improving the character of the cardiac sounds and the rhythm and strength of the pulse.

3. In causing the patient to experience a sensation of comfort and to feel better for the treatment.

4. In one or two cases, in producing the opposite effects in all these particulars, apparently because the heart was feeble and because the patient was fatigued at the time of application.

5. In producing permanent results, although the immediate favorable effects passed off in a few hours.

6. In bringing about a permanent diminution in the area of dulness with improvement of pulse and of the patient's sensations after repeated massage.

7. In a case in which the Schott treatment was unsuitable in giving the most striking benefit.

The physiological explanation of these phenomena is as follows:

1. During the massage of muscles the flow of blood through them is increased.

2. Immediately after the cessation of massage an accumulation of blood occurs in the massaged muscles; this is rapidly followed by an increased flow through the muscles.

3. The massage of a considerable muscular area causes at first a slight rise in the general blood-pressure; this is followed by a fall which in some cases amounts to one-fifth of the initial blood-pressure.

The Schott method of treatment by resisted movements produces :

1. In a large proportion of cases an immediate improvement in the condition of the heart as shown by percussion and auscultation, the sounds becoming more distinct, and the area of dulness diminishing to a greater or less extent.

2. An improvement in the rhythm of the pulse and a more vigorous heart action in many cases.

3. A gradual improvement of a lasting kind, so that the heart recovers its tone and the area of dulness diminishes.

The system of resisted movements is best suited to cases in which a certain power of heart exists, while the mere passive exercises of massage would be applicable to still weaker conditions of the organ.

The method of Oertel, by climbing heights, is followed by excellent results. This method acts primarily by increasing the volume of blood in the muscles and in the skin, thereby relieving the overloaded heart. In this form of exercise a greater muscular power of the organ is demanded than in either of the other systems.

The Nauheim baths of saline and gaseous solutions produce, while the patient is in the bath, an unmistakable reddening of the skin from dilatation of the vessels; and concurrently a pulse of more regular rhythm and strength and slower in rate. The cardiac dulness is also diminished. It is probable that the effects are due to mechanical dilatation of the vessels diminishing peripheral resistance, thereby rendering the work of the overtaxed heart easier. Neither the individual forms of the exercises nor the baths, nor even the combination of the two, is entitled to displace our former treatment by means of rest, diet, and medicine; but each of the exercises and the baths, and still more, their combination, constitute a very valuable addition to the older methods of treatment.

Of the cardiac tonics digitalis is the most valuable. Whenever diarrhoea and vomiting occur we may conclude that we are giving more than is needed for action upon the heart. Digitalis possesses a greater power of contracting the arterioles than any other medicine of the group to which it belongs.

Strophanthus stands next to digitalis. It acts powerfully and rapidly upon the cardiac muscle; but has little influence upon the muscular fibres of the arterioles. Theoretically, therefore, strophanthus should give better results than digitalis. This is not so clinically. Strophanthus is better to use in an emergency, as it acts quicker. The results of strophanthus correspond essentially to those produced by digitalis; and often where digitalis has failed to suit the stomach strophanthus has been fallen back upon with good result. In a certain proportion of cases strophanthus disturbs the stomach more than digitalis does, and has to be discontinued for this cause.

Caffeine, nux vomica, and strychnine are useful cardiac tonics; the latter especially when the other remedies are not well borne.

Among the cardiac remedies which act by dilating the arterioles the best are sodium nitrite and nitro-glycerin. Their effects are purely mechanical.

Iodide of potassium appears to aid the action of cardiac tonics, especially when chronic inflammatory changes are still going on in the valves.

Among the results of cardiac failure to be treated are: dropsy, constipation, catarrh of the stomach, deficient absorption from the intestine, passive congestion of the liver, anæmia, œdema of the lungs, and albuminuria.

R. F. C. Leith, M.A., M.B., F.R.C.P. (Edin.), said that he was inclined to doubt whether the sudden benefits obtained by the Nauheim method were not, after all, to be explained largely, if not entirely, by the influence of the mental factor.

J. Liddell, M.D., and W. Edgecombe, M.B., found the movements and aerated baths of great benefit in the treatment of cases of cardiac failure.

Byrom Bramwell, M.D., divided all the remedies useful in the treatment of cases of cardiac failure into: first, those which increase the tone of the heart muscle; and, second, those which diminish the work of the heart and peripheral resistance. He thought rest and cardiac tonics were the most useful remedies which we possess.

Alexander Morison, M.D., considered the balneological and gymnastic treatment of heart-disease a permanent addition to our means of treating cardiac failure.

Harry Campbell, M.D.—Baths and resisted movements lead to a diminution of blood in the systemic veins and lungs and to a corresponding increase in the systemic arteries. They do this by (a) producing a widespread tonic contraction of the muscles; and (b) increasing the mean capacity of the lungs.

W. G. Earle, M.R.C.S., L.R.C.P.—The effects of the Nauheim baths are, in my opinion, due to the withdrawal of heat from the system. This is considerable, owing, probably, to the iron salts present, although it is not apparent on account of the tingling sensation the waters produce.

T. D. Savill, M.D.—The benefit of the baths and exercises was evidenced, first, by promoting the peripheral circulation, and thus relieving the overburdened heart; second, by promoting the circulation through the tissues and organs, increasing their nutrition.

Theodore Fisher, M.D. (Lond.), thought that dilatation of the heart unassociated with valvular disease would be most benefited by the Nauheim treatment.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
New York City,

WM. G. SPILLER, M.D.,
Philadelphia.

A Case of Rapidly Fatal Cerebritis, resembling Cerebro-Spinal Meningitis, with Exhibition of Sections of the Cerebrum, Mid-Brain, Pons, and Post-Oblongata. (*Journal of Nervous and Mental Disease*, September, 1896.) By James Hendrie Lloyd, M.D., and Joseph Sailer, M.D.

In the first part of this interesting paper a few remarks are devoted to the manifold nature of the disease known as cerebro-spinal meningitis. The following case is reported: A young man, of about twenty-six years, was seized with a sudden severe chill, followed by high fever, headache, and pains in the back and limbs. There was no history of vomiting or convulsions. Delirium developed within twenty-four hours. No history of exposure to infection could be obtained. He was treated at his home for typhoid fever. On the third day of the process it was observed that the patient's left upper eyelid drooped, and that the left eye was turned outwards. A spot of ecchymosis appeared below the lower lid. On the fourth day he was admitted to the hospital in a pronounced typhoid state, and with total paralysis of the left third nerve, which naturally rendered the typhoid nature of the process doubtful. Some tonic spasm of the muscles of the jaw and a rose-colored eruption over the malar bone were noted. The surface of the trunk was hyperæsthetic, otherwise there were no symptoms of irritation of nerve-centres or of the meninges. In a very short time a papular eruption appeared on the face and forehead, and rapidly spread over the entire body. Within a few hours hemorrhage into the tissues occurred, in some places as large as a silver half-dollar. Blood was vomited, and blood, pus, and casts were found in the urine. The disease was diagnosed as cerebro-spinal meningitis.

At the autopsy, hemorrhagic and purulent foci in the cerebrum and punctate hemorrhages in the mid-brain were observed. At the microscopical investigation the pia of the cord appeared slightly thickened, its vessels were dilated and engorged, and contained many leucocytes. About some of the vessels was a slight, round-cell infiltration. Within the cord the larger vessels were not affected, with the exception of an occasional perivascular infiltration. The distinctive alteration consisted of disseminated foci of round-cell infiltration within the gray and white matter. These foci were composed of simple polynuclear cells, with deeply-stained nuclei; such cells were also found scattered singly through the tissues. An obliterated capillary was found at the centre of some of the cellular accumulations. The cell-body of certain of the ganglion cells was diffusely stained, the contour

was irregular, and the processes were absent. The chromophilic bodies in the cells of the hypoglossal nuclei were more irregular in outline, and occasionally a little mass of deeply-stained matter was found to one side of the nucleus. Nerve-cells situated within a focus of round-cell infiltration were much altered. A large focus was found in the left crus, and the cells of the substantia nigra were greatly degenerated. The examination for micro-organisms was negative. From the microscopical findings the process should be considered as acute interstitial encephalitis.

The Functions of the Neuron. (*Journal of Nervous and Mental Disease*, August, 1896.) By F. X. Dercum, M.D.

Dr. Dercum is not willing to deprive the nerve-cell of the honor of transmitting impulses, as Nansen has done; he is not willing to believe that the cell-body is side-tracked, and that the propagation of the excitation is through the cellular processes alone.

The theory of amoeboid movement as applied to nerve-cells has been advocated by Rabl-Rückhard, Lépine, Mathias Duval, and opposed by Kölliker and Ramón y Cajal. Dr. Dercum contends that Cajal practically admits what he verbally denies. If his theory is true that the processes of the neuroglia cells possess this mobility, that they penetrate between the arborizations of the nerve-cells and in this way prevent their contact, then a passive movement does take place. The question is not in regard to degree but to the existence of any mobility at all in cellular processes. A single positive observation outweighs, as Dr. Dercum says, all negative ones. Wiedersheim saw the nerve-cells in the œsophageal ganglion of a living animal (an entomostracan) move, and while from this statement the claim is not made that nerve-cells in vertebrates possess a gross amoeboid movement similar to that in the cells of this low type, the observation justifies the assumption of a certain amount of mobility in the human nerve-cells.

Dr. Dercum employs this idea in explaining hysteria. Hysterical paralysis is due to imperfect contact of the cortical neurons with the spinal. Sudden restoration of power means the re-establishment of normal relations. In the same way the shifting anæsthesia and the effects of hypnotic suggestion are explained. Sleep is not the result of anæmia of the brain, but of retraction of the cellular processes. Spontaneous wakening means restoration of the exhausted nerve-cell and extension of its processes. Thought is the result of afferent impulses in connection with different combinations of the various neurons.

[Azoulay and Pupin, in France, have recently published their views on the relation of the nerve-cells to one another, and Pupin especially has devoted his attention to the amoeboid movement. His view in regard to the mechanism of sleep is like that advanced in the above paper. Dr. Dercum's opinion has been formed independently of the work of these authors, and he may be considered as the first exponent of this theory in America.]

Hysterical Achillodynia. (*Revue Neurologique*, June 15, 1896.) By C. Féré, M.D.

Dr. Féré speaks of the pain in the tendon of Achilles during extension or under pressure on the side of the body in which the hysterical stigmata predominate. It is associated with swelling of the part, and persists after the other hysterical symptoms have disappeared.

Albert has described such a pain in the tendon of Achilles, which disappears when the patient is lying down.

In the two cases reported by Féré the pain appeared to be due to hysteria. Both these patients had hysteria of a severe type. This neurotic pain is not as uncommon as is supposed.

Hemiatrophy of the Tongue, with the Report of a Case. (*Journal of Nervous and Mental Disease*, July, 1896.) By C. W. Burr, M.D.

A young woman, who had had syphilis, came to the hospital complaining of a "crooked tongue." She had had headache, usually behind the left ear, and at times severe vertigo. According to her statement, she awoke one morning and found the left side of the tongue swollen and black, though without pain. Some weeks later this half of the tongue was noticed to be about half as large as the right, was irregularly depressed and elevated, and on protrusion deviated to the left. There were no fibrillary twitchings. Common sensation and sense of taste were preserved. Numbness in the hands was mentioned. During the progress of the affection difficulty in swallowing solids, incoherent speech, pain on the right side of the head, temporary diplopia, slight ptosis, absence of reaction to light, and slight reaction to accommodation were noted.

The author believes the case to be one of basal syphilitic meningitis.

A very careful review of the literature is given.

Pure Word Deafness. (*Revue Neurologique*, No. 12, 1896.) By Hélot, Houdeville, and Halipré.

The patient, whose history is given in detail, suffered for a long time from middle-ear disease, and observed that alcoholic excesses caused a permanent impairment of his understanding of spoken words. After drinking one day more than usual he fell into a state of coma; on regaining consciousness he was unable to understand what was said to him.

All other parts of speech were intact. He could speak, write, read, reply to written questions, write spontaneously, and copy. He said repeatedly, "I know that you are speaking, but I do not understand; I can count the syllables, but I do not grasp the meaning."

He understood, however, a few words and could write them on dictation. Musical deafness was almost complete.

As the word-concept was intact it was necessary to believe that the cortical centre for word hearing was uninjured, and that the lesion was subcortical. Ordinary hearing was not affected.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children,

AND

LAWRENCE S. SMITH, A.B., M.D.,

Instructor in Clinical Gynæcology in the University of Pennsylvania.

A Peripheral Facial Paralysis in an Infant after a Normal Labor. (*Centralblatt für Gynäkologie*, 1896, No. 24.) By Geyl, M.D.

The rarity of such a condition following normal labor makes it interesting. On the morning after birth a loss of function was noticed in the right facial nerve, allowing a drooping of the mouth, an obliteration of the mento-labial and naso-labial folds, and an interference with the action of the lower lid. At the end of two weeks the infant gradually recovered the use of its muscles.

Facial Paralysis in an Infant after a Normal Labor. (*Centralblatt für Gynäkologie*, No. 27.) By Ludwig Knapp, M.D.

In this case the paralysis began to disappear soon after birth, and had vanished almost entirely by the fourth day. This rapid disappearance would exclude a central origin, and Knapp believes the injury to have been caused by the marked pressure œdema of the skin over the branches of the nerve.

A Case of Primary Prolapsus Uteri; Ventrofixation; Twin Pregnancy with a Successful Termination. (*Centralblatt für Gynäkologie*, 1896, No. 24.) By A. O. Lindfors, M.D.

The patient, aged thirty, married one and a half years without pregnancy, had suffered for fifteen years from a prolapse, brought on by harvesting. A colpo-perineorrhaphy six years ago had been a failure, so a ventrofixation was determined upon. An area of peritoneum the size of a thumb-nail was removed from the anterior wall of the uterus one and one-half centimetres below the fundus, and the womb was stitched to the abdominal wall four centimetres above the symphysis by means of three silkworm-gut sutures. A Tait perineorrhaphy completed the operation. This was in April, 1895. In August the patient became pregnant, and was delivered of twins in April, 1896.

Grape-Sugar in the Urine and Amnionic Fluid. (*Centralblatt für Gynäkologie*, 1896, No. 25.) By Emil Rossa, M.D.

The patient was a rachitic primipara in the seventh month. Her urine was normal in amount, but showed a percentage of 0.46 of grape-sugar. When abortion was induced, three litres of amnionic fluid were obtained

containing 0.345 per cent. of grape-sugar. The first day after delivery the percentage of sugar in the urine was 0.38, the second day 0.92, and then gradually fell until the sixth day, when it disappeared entirely. The specific gravity was never higher than 1022, and averaged 1017.6 for the six days that sugar was present.

The urine obtained from the infant by catheterization contained no sugar.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,
Paris, France.

Extraction of a Metallic Foreign Body from the Posterior Segment of the Eye by the Aid of an Electro-Magnet. Extraction des corps étrangers métalliques du segment postérieur de l'œil à l'aide de l'électro-aimant. (*Annales d'Oculistique*, Mars, 1896.) Rohmer has had the good fortune of extracting a piece of steel which measured one by two millimetres in size and weighed one milligramme from the vitreous humor by means of the electro-magnet of Chardin. The body was secured with the loss of but a few drops of vitreous after the third trial through a three-to four-millimetre incision made through the sclerotic,—at seven millimetres distance from the limbus cornea, between the insertions of the inferior and internal recti muscles.

The wound healed without any inflammatory reaction. Nearly a year later vision was normal and the eye remained perfectly quiet.

The Treatment of Subconjunctival Ecchymoses by Eserine. Le traitement par l'esérine des ecchymoses sous-conjunctivales. (*Annales d'Oculistique*, Mai, 1896.) In a brief though valuable communication, Hubert Burnham, of Toronto, Canada, draws attention to his success in the use of eserine in the treatment of subconjunctival hemorrhage of recurrent type. He has found that the drug is of value in producing rapid absorption of the effused blood, and that it seems to prevent recurrence of extravasation.

The Röntgen Ray in Ocular Surgery. Les rayons Röntgen en chirurgie oculaire. (*Archives d'Ophthalmologie*, Février, 1896.)

As the result of a series of experiments, Van Duyse, of Gand, has been able to obtain a radiograph of a leaden grain that he introduced into the posterior chamber of a rabbit's eye. The organ was made to protrude, and the plate was placed beneath it, the rays being allowed to pass from above.

He is of opinion that the method might be made of use in determining the presence of foreign objects in the anterior portion of the human eye, especially if an artificial exophthalmus can be produced by subconjunctival injections of normal salt solutions beneath the capsule of Tenon, the rays being allowed to pass nasally from the tube placed at the temporal side of the organ.

Upon the Employment of Dry Dressings and Powders in the Treatment of Affections of the Eye. Sur l'emploi des pansements secs et des topiques pulverulents secs dans le traitement des affections oculaires. (*Annales d'Oculistique*, Mars, 1896.)

In the treatment of eczematous and impetiginous inflammation of the lids, conjunctivitis especially of the phlyctenular type, keratitis even in the infectious varieties, Rogman, of Gand, has had most successful results with the tribasic sulpho-salicylate of bismuth,—so-called thioform. He has found it of great value in lessening conjunctival irritation and secretion from the improper wearing of artificial eyes.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

A CASE OF MALPRACTICE IN DIAGNOSTICATING OVARIAN TUMOR.

THE character of examination which may expose a physician to the liabilities for malpractice in diagnosing ovarian tumor was recently shown by the evidence in the trial of an action¹ for damages brought by one C., the husband of the patient, against Doctor B., the attending physician, and Doctor A., a specialist, who was the consulting physician, for negligence in making an examination of his wife, as a result of which the cause of her affliction was diagnosticated to be ovarian tumor, whereas the operation which was performed in consequence of such mistaken diagnosis disclosed the growth to be a fibroid tumor of the uterus. A verdict was rendered for both defendants, in accordance with the peremptory instruction of the trial court, and judgment was entered thereon; but the Supreme Court reversed this judgment as to Doctor A., the specialist, and directed judgment to be entered against him, while it affirmed the judgment in favor of Doctor B., the attending physician.

¹ Cheswold *vs.* Blank, 66 N. W. R. 819 (1896).

The mistake of the defendants in diagnosticating the cause of Mrs. C.'s affliction to be an ovarian tumor when the operation showed it to be a fibroid tumor of the uterus was clearly established. And the evidence bearing directly upon this subject was given by Doctor T., who, by invitation of the defendants, witnessed the operation, and who testified, in substance, that no tumor was removed from the person of the patient; also, by Mrs. B., proprietress of the hospital in the city of X., to which Mrs. C. had been taken for the purpose of the operation, who testified to a conversation with Doctor A. shortly thereafter, in which the latter remarked that the only tumors discovered during the operation were immovable fibroid tumors of the uterus, and in which conversation he requested the witness to make no statement concerning the subject to Mrs. C.'s friends. It was shown that Doctor B. made a superficial examination when first consulted upon the subject, which satisfied him respecting the cause of the illness from which Mrs. C. was suffering, and that the only other examination was made by Doctor A. in the presence of his co-defendant, the day preceding the operation. As to what transpired at the time last mentioned, the plaintiff testified: "Doctor A. made the examination. He first placed the patient in his chair, and exposed the abdomen, and with his hands pressed in every way, pushing and working the abdomen in every possible way. Then he took one hand, and tapped, and then the other; then one side, and then the other; and then from below. That is all the external examination he made. Then, after that, he inserted his finger in the vagina, and seemed to be feeling of the uterus. . . . I think the first remark was made by Doctor A. to Doctor B. He said, 'Doctor, it is just as you said.' My wife next asked the question, 'What is it?' He said, 'It is an ovarian tumor; no doubt about it.'" The time consumed in the examination, as here referred to by this witness, did not exceed ten minutes, and was made without the assistance of instruments of any kind.

The plaintiff called as witnesses several physicians and surgeons, who concur in the opinion that an operation should not be attempted for a suspected uterine or ovarian tumor without a most thorough examination of the person of the patient; and they agree that in all cases of doubt, where the theory of pregnancy is excluded, the uterus should be explored by means of a sound, in order to ascertain the depth of that organ. One witness, Doctor D., testified as follows:

"Q. Is there any case, except in which the tumor has attained such a size where the life of the patient demands its immediate removal, in which it can be said that the sounding of the uterus might be omitted from the diagnosis of the case, and still an attempt be made to perform an operation?

"A. No; I think there would be nothing to justify an operation in the case except something that would threaten the life of the patient. A complete and thorough examination of the case where an abdominal tumor is suspected would be by several methods: first, by palpation, which simply means the use of the hands over the abdomen; a feeling of the parts by

careful manipulation of the hands over the abdomen, and percussion or tapping of the parts with the fingers externally, or with some instrument, to get the sounds elicited by percussion ; an examination of the parts that can be reached through the vagina ; by measurement of the abdomen as to the breadth and height of the mass ; an examination with the vaginal speculum ; and in many other cases, and in all cases of doubt, where pregnancy is absent, the use of the uterine sound.

“ Q. Are the methods of examination you have suggested necessary and indispensable to a careful and proper examination of the patient, where pregnancy does not exist and the presence of a tumor is suspected ?

“ A. Yes, sir ; of course, where there is a prospect of an operation, it always demands a more careful examination, if possible, than a man would make simply for the purpose of trying to tell the patient in a general way what the matter is. The very fact that a man is going to make an operation increases his responsibility in diagnosing the case, and he had better make a mistake where he is not going to operate than where he is.”

Doctor R., another witness, testified that the surgeon should be able, by means of conjoined manipulation, to determine, “ to a tolerable certainty,” the size and location of the tumor, and whether it is liquid or solid ; that, if connected with the uterus, it is pretty certain to be solid, and, if connected with the ovaries, it is pretty certain to be a cyst.

Mr. Chief-Justice Post, in delivering the opinion of the Supreme Court, said, “ It is not pretended that there was in this instance any suspicion of pregnancy, and no objection existed on that ground to the exploration of the uterus in determining the location and character of the tumorous growth. Nor can it, on the record before us, be contended that this case is within the other exception mentioned by Doctor D.,—namely, where the condition of the patient is so critical as to require heroic treatment, and where an operation is justifiable as a last resort, without the precautionary sounding of the uterus. The testimony of the medical witnesses tends, therefore, directly to prove the wrong alleged,—namely, negligence in the examination of the plaintiff’s wife, and the consequent unfortunate result thereof.

“ We agree with counsel for the defendants that physicians and surgeons are not required to exercise the utmost degree of care or to possess the highest attainable skill in their profession. They do, however, by virtue of the relation assumed by them towards patients, impliedly engage that they possess ordinary skill, and that they will, in the course of their employment, exercise such necessary and proper care and attention as may reasonably be expected from members of their profession under like circumstances.

“ There being competent proof upon the vital issue of the case, and tending to sustain the cause of action charged against one of the defendants, a question was presented for submission to the jury, and the direction in favor of both defendants at the conclusion of the plaintiff’s evidence

was error, calling for a reversal of the judgment, so far, at least, as it applies to Doctor A. It remains to be determined whether the court erred in directing a verdict in favor of Doctor B. Upon that question the conclusion reached from an examination of the record is that the engagement and responsibility of the last-named defendant terminated with the employment of Doctor A. When first consulted upon the subject, he advised the plaintiff to consult some physician who was a specialist in that line, saying that he did not consider himself qualified to perform the required operation. To the question, 'Did Doctor B. say who you had better go to?' the plaintiff answered, 'I don't think he advised any one very strong. The idea was to get the best doctor.' His attitude towards the case after surrendering the patient to the care and treatment of Doctor A. was that of friend and counsellor only, and in no sense that of a physician or surgeon. The direction in his favor was accordingly right, and the judgment as to him will be affirmed; but the judgment for the other defendant, Doctor A., is reversed."

BOOK REVIEWS.

DISEASES OF THE EYE. A Hand-Book of Ophthalmic Practice. By G. E. de Schweinitz, M.D., Professor of Ophthalmology in the Jefferson Medical College, Philadelphia, etc. A handsome royal octavo volume of 679 pages, with 256 fine illustrations, many of which are original, and 2 chromo-lithographic plates. Prices: Cloth, \$4.00 net; sheep or half-morocco, \$5.00 net.

The second edition of this work contains a great deal of new matter, and instead of the bibliography of the first edition the author has added an appendix. In the latter we find a full description of the method of determining the corneal astigmatism with the ophthalmometer of Javal and Schiötz, and the rotations of the eyes with the tropometer of Stevens. The chapter on operations consists of eighty pages clearly illustrated; the descriptions of various steps employed are so plain and direct that the book has become a most valuable guide to students and practitioners. New paragraphs are introduced on the subjects of filamentous keratitis; blood-staining of the cornea; essential phthisis bulbi; foreign bodies in the lens; circinate retinitis; symmetrical changes in the macula lutea in infancy; hyaline bodies in the papilla; monocular diplopia; germicides; the use of Schleich's infiltration anæsthesia; and the sterilization of collyria. The chapters on general optical principles and on normal and abnormal refraction, originally written by Dr. James Wallace, have been revised by Dr. Edward Jackson, and thus made doubly valuable.

The descriptions of the tests for astigmatism are clear and the illustrations for the use of the Maddox rod and the diagram explaining the method of focussing the vessels by the meridians of an astigmatic eye are good examples of the way in which the illustrations teach. There is a little carelessness on page 117 where a note seems to have been omitted, and also on page 609 where the references are defective.

The publisher requests us to state that the following errors, which occurred in

the first few copies of the work, have been corrected. On pages 518-520, Fig. 163 should be where Fig. 166 now is; Fig. 166 should be where Fig. 165 now is; Fig. 165 should be where Fig. 163 now is.

G. H.

FUNCTIONAL DISORDERS OF THE NERVOUS SYSTEM IN WOMEN. By T. J. McGillicuddy, A.M., M.D. New York: William Wood & Co. 8vo, 367 pp.

The author states that he writes from the stand-point of the general practitioner; one-fourth of the book is therefore given up to therapeutics, and this is really the valuable part of the publication. The full directions as to the use of food and stimulants will be read with profit and will be found to rest on a sound basis. Examples are given of reflex neuroses from every conceivable source, particular attention being paid to hysteria and hystero-epilepsy. The author would give his hearers a false sense of security when he says, "Another mistake which is often made is to call tubercle bacilli the sole cause of tuberculous infection, since tuberculosis will never affect people with good constitutions, but only those with poor, broken-down constitutions. People with good constitutions may continually inhale the bacilli without any bad effects whatever." It would hardly seem necessary to adduce evidence to prove that even the most robust man, the most finished athlete, is liable to become infected with tuberculosis in its most rapidly progressing type. Indeed, this is a common cause of death in prize-fighters in spite of their remarkable physique. The large number of clinical histories which are recorded in this volume afford much interesting reading.

G. H.

MANUAL OF MIDWIFERY, for the Use of Students and Practitioners. By W. E. Fothergill, M.A., B.Sc., M.B., C.M. New York: The Macmillan Company. Price, \$2.25.

Embodying as it does the teachings of the Edinburgh School of Obstetrics, this excellent little book should certainly recommend itself to both students and practitioners. Its four hundred and seventy-five pages make its size convenient, its style is excellent, its arrangement is systematic and comprehensive, and its seventy illustrations have been carefully selected, many of them being from original drawings and photographs.

In Chapter II., under the Functions of the Female Reproductive Organs, the most recent and most generally accepted theories of menstruation, ovulation, and conception are discussed. Chapters III., IV., and V. present an excellent description of the formation and fate of the decidua, and the growth of the early ovum with its membranes and placenta. The author has succeeded in giving a very clear and at the same time a condensed account of these complicated embryological processes. In the chapter on ectopic gestation the latest views of Webster, Sutton, Tait, Hart, and Martin are discussed, and these abnormal pregnancies are classified according to their views.

The mechanism of labor is simplified by division into four movements of the head instead of the more complicated theoretical German classification. The description of the movements is clear and concise; they are (1) flexion, (2) internal rotation, (3) extension, and (4) external rotation. The author holds that the child's head is bent upon the chest from the first so that the term flexion has nothing to do with the position of the head relative to the body of the child but to the pelvis of the mother, and that the word is therefore misleading. Flexion is due to the less resistance presented to the descending part by the short anterior wall of the pelvis; it results from the more rapid descent of the anterior part. Internal rotation, "the movement of the leading part from the side of the pelvis to the front," is accounted for by Hart's theory that "whatever part of the fetal head or trunk first strikes a lateral part of the sacral segment is rotated internally to the front. . . . The direc-

tion of rotation may be predicted in any case by noting what part first strikes persistently a lateral half of the sacral segment."

Extension is not a movement in which the chin leaves the sternum; the head continues to advance until the occiput passes under the pubic arch and the sinciput passes over the distended perineum, and no part of the head is arrested during the whole process.

Following the Mechanism of Labor is a chapter on the Sectional Anatomy of Labor, with a discussion of the third stage, based on five frozen sections of which excellent full-page cuts are given. The author rejects the theory of placental separation by blood extravasation, and inclines to a combination of the theories of detrusion and disproportion between the placental area and the placental site.

The chapter on the management of normal labor contains many useful hints in regard to instruments, examinations, preliminaries, and the management of the labor itself.

Placenta prævia, accidental hemorrhage, retained and adherent placentæ, and postpartum hemorrhage receive careful attention, especial emphasis being given to the use of hot water in the last condition.

The evolution of the forceps, their action, the indications for their use, and the method of their application are treated quite fully and illustrated by a number of excellent cuts. In the opinion of the author the axis-traction forceps, of which the Simpson-Tarnier and the R. Milne Murray are the best, should supersede all others, as with them traction must always be made parallel to the axis of the parturient canal, no matter what the position of the head.

In the discussion of version *versus* forceps the advice is given that podalic version should not be used in cases of difficulty when the head presents, and that where possible cephalic version should always be attempted. L. S. S.

ITEMS OF INTEREST.

IN Great Britain the Society of Medical Phonographers has been founded to promote the use of phonetic short-hand in medical work. This society has made steady progress, and it now numbers two hundred and fifty names on its membership roll. This society issues the *Record*, a monthly medical periodical in lithographed short-hand, and has recently published two small pamphlets dealing with the use of short-hand by the student and by the practitioner respectively. More recently a list of twenty-five hundred phonographic outlines of medical terms has been issued. The value of short-hand as a means of securing not only adequate records of facts, but of intercommunication, has led to the establishment of various circulating manuscript magazines, each of which presents the advantages of a small medical society even to those who are in remote parts of the kingdom, while at the same time affording practice in reading. The annual subscrip-

The Society of
Medical Pho-
nographers.¹

¹ British Medical Journal, September 12, 1896.

tion to the society, which is five shillings, or in the case of students before qualification three shillings, entitles the subscriber to receive post-free all the phonographic literature issued by the society for the year. The society has petitioned the general medical council to make short-hand an optional mark-bearing subject at the preliminary examination. The educational committee of the council has had this petition under consideration and will report on it at the next meeting. Dr. Gowers has been chiefly instrumental in securing the organization of the society.

The sixth annual meeting of the American Electro-Therapeutic Association was held in Allston Hall, Boston, Massachusetts, September 29 and 30 and October 1, 1896. There was a good attendance and many papers of scientific interest and therapeutic value were read. An exhibition of modern electrical apparatus, such as batteries, static machines, meters, current controllers, electrodes, etc., as well as other instruments, was held in connection with the meetings.

Consular Agent Landgraf, at Bloemfontein, says that no country on earth can rank with the Orange Free State as a health-resort. That so few people go there is due to the fact that the country is so little known. In the majority of countries it is believed to be a desert, inhabited by brutal natives and wild beasts. The country, in fact, is pretty well populated and cultivated. Living is rather expensive, and persons intending to go there to reside should command from fifty to sixty dollars per month. A family of four persons can live decently on fifteen hundred dollars a year. Persons in advanced stages of tuberculosis of the lungs should travel by stages from the sea to Orange Free State. Such patients should stay a month at Ceres, and then for a time at Beaufort West, until they are prepared to stand the dry climate. A direct journey to Bloemfontein would mean death to such persons. Capetown is the landing place.

¹ Sanatarium, September, 1896.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

DECEMBER, 1896.

[No. 11.]

ORIGINAL COMMUNICATIONS.

SYRINGOMYELIA.

*BEING THE ALVARENGA PRIZE ESSAY OF THE COLLEGE OF
PHYSICIANS OF PHILADELPHIA FOR THE YEAR 1895.*

(Continued from page 638.)

BY GUY HINSDALE, A.M., M.D.,

Philadelphia.

The vast majority of subjects of syringomyelia, whether male or female, belong to the laboring classes, and in such patients repeated injury of a joint is liable to occur, especially if the sense of pain has been impaired or abolished. In many of these cases it requires only a slight accident to give rise to affections of the joints. It is not uncommonly observed that in cases of trophic disturbances of the skin a slight mechanical or thermic irritation is often followed by active vasomotor troubles and by various symptoms such as would not occur from similar exciting agents in healthy persons.¹

It must not be concluded, however, from such premises that syringomyelic arthropathies are of traumatic origin. Volkmann maintained that such was the case in tabes, but his view has not been accepted, and the prevailing opinion, based on clear evidence, is that they are distinctly trophic lesions. The obscure nature of the arthropathy is borne out by the various theories that have been formulated for its explanation. That they are syphilitic as Strümpell has claimed we cannot admit, nor can we concede that they are rheumatic in origin. Buzzard's theory that they are due to an invasion of the medulla oblongata because, as he claimed, they were co-incident with gastric and laryngeal crises is equally untenable. This author

¹ See cases of Jurgens and Marinesco.

fortified his position by arbitrarily assigning to the medulla a trophic centre for the bones and joints.

Believing with Charcot, Blocq, Hoffmann, Nissen, and Marinesco that the arthropathy of syringomyelia is entirely analogous in its origin to that of tabes, we deem it entirely fair to use the same arguments in support of the explanation of the nature of syringomyelic arthropathy that have been adduced to explain that of tabes.

Among the earliest investigations of this subject was that of Charcot and Joffroy in 1870 (*q. v.*). They examined the spinal cord of a woman who had had locomotor ataxia for ten years, with a large tabetic arthropathy of the left shoulder, and with complete destruction of the head of the humerus. In addition to a characteristic sclerosis of the posterior columns, there was a remarkable atrophy of the left anterior horn in the cervical region, with destruction of many cells particularly in the posterior external group. At other levels the anterior horns were normal.¹

In another instance Charcot and Joffroy found an atrophy of the anterior horn of the lumbar cord coincident with arthropathy of the knee of the same side, and they believed them to be in the relation of cause and effect. Later investigations by Pierret (1870), de Lionville (1874), and Seeligmüller seem to support this view; but those of Bourceret (1875), Raymond (1875), Pitres and Vaillard (*Revue de Médecine*, 1886), and Pavlides (1888) have afforded negative observations. Talamon also failed to find any lesion of the anterior horns in several autopsies in cases of spinal arthropathy. Pitres and Vaillard did find, however, in four cases of tabetic arthropathy alterations of the periarticular nerves, and even of the capsular filaments, and from these observations they announced the theory of the peripheral nervous origin of the affection, in which they have been supported by Siemerling.

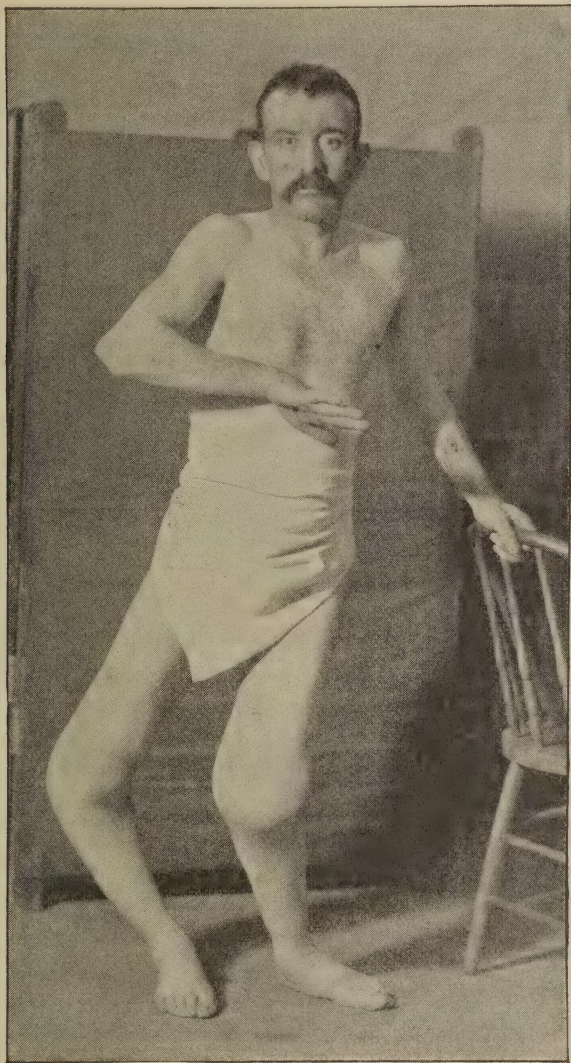
Marinesco has examined the spinal cord (*Revue Neurologique*, July 30, 1894), the crural nerves, and articular filaments in a case of double tabetic arthropathy. The cord showed a system-sclerosis of the posterior columns, having its greatest intensity in the lumbar region. In this situation there remained in the posterior columns only a few scattered fibres in the cornu-commissural zone. There were still a few fibres scattered through the other zones of the posterior columns. The zone of Lissauer was completely degenerated, as well as the posterior horns. The anterior horns were normal throughout the entire lumbar region. The crural nerves on both sides showed well-marked degeneration, which appeared particularly in certain bundles of fibres,—in other words, there were atrophied medullated nerve-fibres. The articular nerves had also degenerated.

Finally, in a well-marked case of arthropathy in general paresis, studied by J. H. Lloyd, an illustration of which is presented for comparison, it

¹ It will be noticed in this connection that the arthropathies of syringomyelia are chiefly in the upper extremities, and that the usual site of the central lesion is in the lower cervical and upper dorsal regions.

could not be affirmed that a direct connection was apparent between the cord lesions and the arthropathies, but the opinion was expressed that this connection existed probably by way of the nerve-roots. The spinal cord in this case showed, first, partial posterior sclerosis, and, second, sclerosis of

FIG. 16.



Arthropathy in general paresis. (From a case of Dr. Lloyd, in the Philadelphia Hospital.)

the motor tracts from one hemisphere,—*i.e.*, the crossed pyramidal tract on the right side and part of the direct pyramidal tract on the left side. The multipolar cells of the anterior horns in the region examined (mid-dorsal region) did not present very marked changes.

We are very much in need of a further study of the nature of syringomyelic arthropathy.

The arthropathies of syringomyelia, as well as of tabes, have been arranged under two heads: first, the atrophic form, which is the rarer; and, second, the hypertrophic form, more usually seen, and which resembles in some respects the lesions of arthritis deformans.

Recent investigations lead to the opinion that a lesion of the articular sensory nerves is accountable for these arthropathies. Goldscheider's observations show that the articular surfaces are sensitive to mechanical and thermic irritations. Recent studies by Golgi show that numerous sensory nerve-corpuscles exist in the tendons themselves, but no one has yet described trophic nerves passing from the centre to the periphery in a manner analogous to the nerve-fibres of muscles and glands. "We may then understand how, in the atrophic form of arthropathy, at least the articular surfaces of the bones, deprived of their sensory nerves by degenerative processes, are thereby unable to recognize the adverse conditions to which they may be subjected. The nutritive function being dependent on intact sensory innervation is, therefore, abated as the communication with the vasomotor centres is gradually lost. The resulting impoverishment of the blood-supply results in the wasting and reabsorption of the constituents of the articulation."¹

On the other hand, an ingenious theory is advanced to explain the hypertrophic form. "It is a recognized fact that in healthy individuals there are certain spontaneous compensations of nutrition. Applying, now, the same principles in pathologic conditions, it may be urged that in some forms of arthropathy, for example, portions of an articulation are deprived of a regular nutritive circulation because their centripetal nerve-supply is impaired. Thus it may occur that the neighboring portions remaining unaffected enjoy a compensatory increase of nutrition corresponding to what has been denied the affected regions." However this may be, hypertrophies do occur in the neighborhood of those portions of joints that have undergone impairment of innervation. The *modus operandi*, according to Marinesco and others, is, therefore, a mechanism which, starting in the centripetal nerves of the articulation, reacts in such a way upon the vasomotor centres, and thence again to the vasomotor fibres distributed to the articular surfaces, that the trophic changes result.

To sum up the determination of the two forms of arthropathy as observed in syringomyelia, tabes, etc., we may say that if there exists only an impaired action of the sensory nerves, by which they are incompetent to transmit impressions from the joint to the centre, the atrophic form of arthropathy will result. If now there is added a compensatory adjustment by which fibres remaining intact bring about an increase of nutrition to the surrounding unaffected portions of the articulation, we will have the phenomena of hypertrophy.

Attention is drawn to the influence of pathogenic microbes in the pro-

¹ Marinesco.

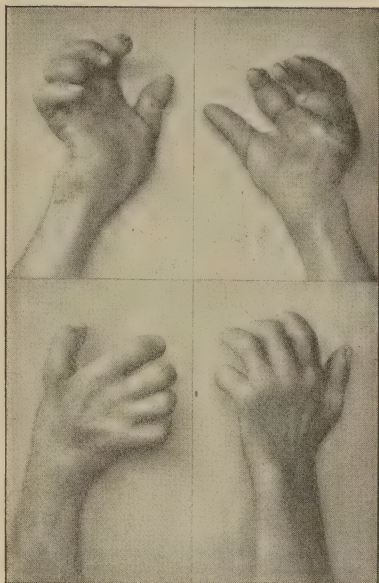
duction of arthropathies. Where innervation is impaired the tissues, particularly at the extremities, are not well able to resist the invasion of microbes. Such affected areas constitute the points of least resistance, where their penetration is easy and their multiplication undisturbed. Those changes of infectious nature are well seen in Morvan's type of syringomyelia, and in a case of combined syringomyelia and leprosy,—such as, for instance, one reported by Souza-Martin. As in the arthropathy of hemiplegia, so in Morvan's type of syringomyelia, the changes are due to the combined influence of a direct pathological process involving the central nervous system and, in addition, the action of pathogenic microbes which have been introduced from without at a vulnerable point.

We have referred to the resemblance which the hypertrophic arthropathy of syringomyelia may bear to arthritis deformans. Volkmann endeavored to make the anatomical distinction in these cases that in the latter disease the formation of new bone is confined to the interior of the joint capsule, while in the spinal arthropathies there may be extensive ossification of the periarticular soft parts with formation of osteophytes.

Such a distinction, however, does not hold, for examples of arthritis deformans are met with on post-mortem examination in which there were abundant bony formations outside the limits of the affected joint, and especially in the adjacent tendons and ligaments. The articular surfaces co-ossified in places may be deformed either by partial fractures or by osteophytes with which they are surrounded. Isolated bony growths, developed in the tendons or aponeuroses, seem to be met with more often in syringomyelia than in tabes.¹

In the hypertrophic form the ligaments and the capsule of the joints involved are relaxed or destroyed, with a consequent mobility of the adjacent ends of the bone. Such was the condition in a patient of Dr. Alexis Thomson, of Edinburgh. (Fig. 15.) A similar condition was also seen in Dr. Dercum's case at the Philadelphia Hospital. (Fig. 18.) Dr. Thomson calls attention to the fact that it is clearly the duty of the surgeon in all cases of unusual forms of joint-disease, repeated dislocation, or spontaneous

FIG. 17.

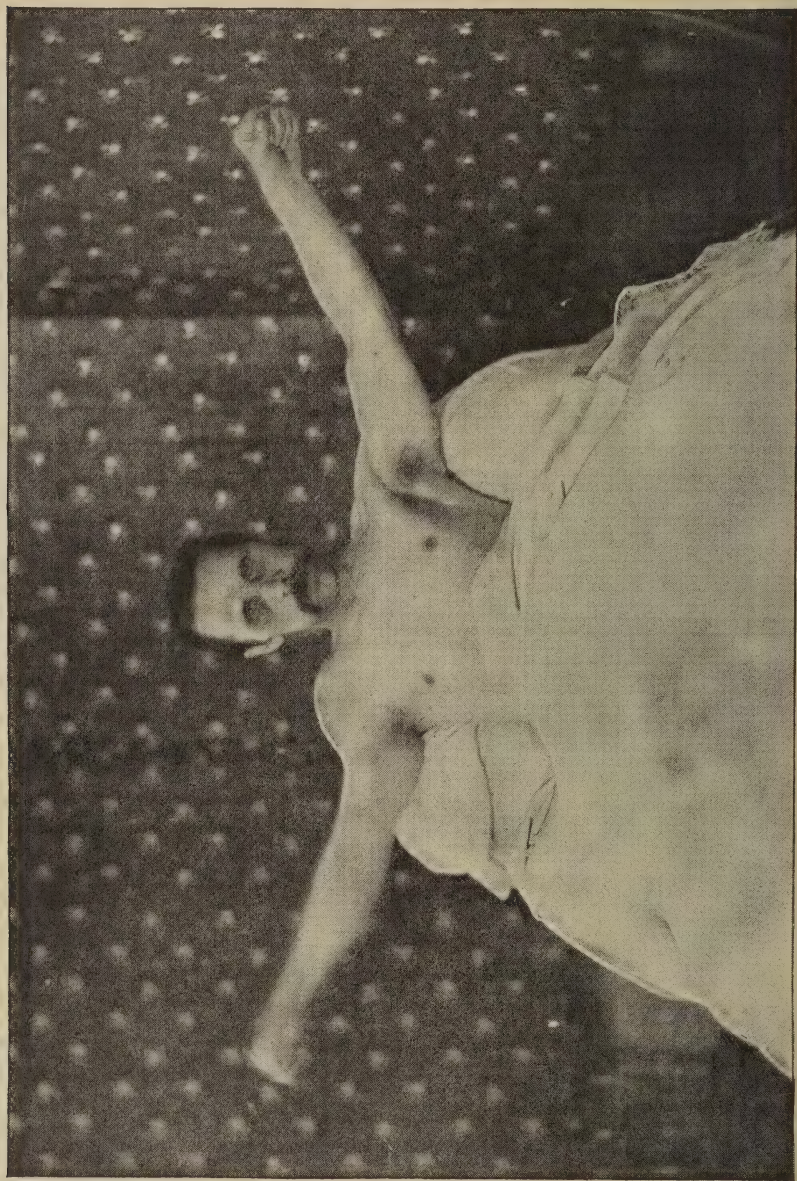


Arthropathy of Morvan's type. (Curschmann's case.)

¹ For example, in a case of Hoffmann's, of syringomyelic arthropathy, there was an osteoma of the anconeus muscle.

fracture, to investigate accurately the sensibility to pain and temperature,—features which will occupy our attention later,—for otherwise this disease will continue to escape recognition in surgical practice.

FIG. 18.



Arthropathy of the shoulder. (Case of Dr. Dercum, in the Philadelphia Hospital.)

(d) *The Bones*.—Lastly, we may have serious alterations of the shafts of the bones. Fractures occasionally occur spontaneously, or by slight efforts or accidents. These fractures, like the arthropathies, are painless, and hence may escape detection for a considerable length of time. Union is delayed, and there is a great liability to vicious or redundant callus. In

some cases the fracture remains ununited, and a false joint forms. One of the best illustrations of fractures of this kind is that of Schultze, cited by Thomson and Bruhl. It occurred in a healthy man, aged twenty-four, in whom the first evidence of syringomyelia was a "spontaneous" fracture of the humerus, caused by an energetic muscular effort. Because of the loss of sensibility to pain this patient only knew of his fracture by the noise of the break and by the loss of power in the limb. He subsequently fractured his left radius and fifth metacarpal,—all bones of the upper extremity. After death, at a later period, of septic meningitis, Schultze found that all the fractures had united in a satisfactory manner, and that there was no abnormal fragility of the bones, such as might have been reasonably expected. He endeavors to explain the liability to fracture in these cases by the loss of the muscular sense and of sensibility to pain, allowing the patient to exert more muscular effort than is required for the object in view or than the bone can stand.

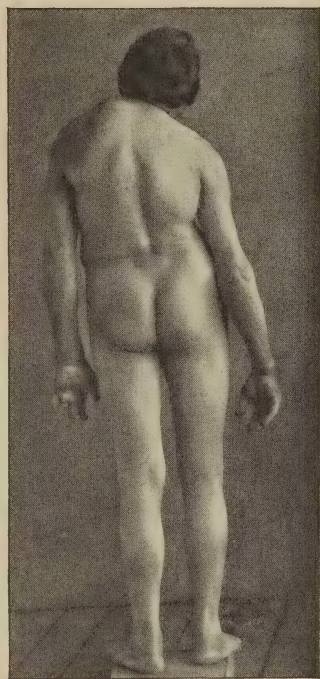
Lastly we may have trophic changes in the bones, particularly of the hands and fingers, that partake of the nature of acromegaly.¹

(2) *Deviations of the Spinal Column.*—

Changes in the spinal column have been observed in so many cases of syringomyelia that they have come to be regarded as a characteristic symptom. Lancereaux was probably the first to notice this in a case of syringomyelia, which he described in 1861 under the name of hypertrophy of the ependyma. Although the earlier observations on syringomyelia generally made no mention of the state of the spine, it is now given a prominent place in the symptomatology of the disease. In an analysis of the one hundred and eighteen cases found in the appendix, we find that deviations of the spinal column are noted in forty-four cases. Bruhl states that this frequency is about fifty per cent. and Schlesinger gives forty per cent. The

more carefully the examination is made the more likely will the percentage be found to be increased. The accompanying photograph of one of Curschmann's cases shows this deformity in a marked degree. In one of the cases described by the author (case of Robert Collins, see Case No. I.)² there is

FIG. 19.



Scoliosis in syringomyelia. (Curschmann's case.)

¹ See cases of Marie, Holschevnikoff, and Peterson.

² See Cases XXVII., XXXIV., XLIX.

a marked deformity. Hallion, Hoffmann, and Jeffries have also published excellent examples.

The usual form of deviation is scoliosis; in some cases this is associated with kyphosis. Pure kyphosis is very rare, but has been observed in the cervical region. Lordosis is uncommon, but when present may be looked for in the lumbar region.

Scoliosis may involve, together with the compensatory curves, the entire length of the spinal column, but the favorite seat is the dorsal region. The convexity of the curve looks usually to the side which is affected earliest and on which the muscles are impaired. This impairment allows the stronger muscles of the opposite side to contract more effectually, with the result that a convexity on the opposite side of the spinal column is produced. This deformity, obviously, is more marked in cases where the disease is unilateral.

Exceptions to this may occur, as, for instance, in a case of Kahler's in which the spine was normal, although there was a strong predominance of the disease on the left side; but in this case the muscles of the trunk were believed to be spared.

In one hundred and eighteen cases analyzed in appendix, scoliosis was noted in thirty-six.

Convexity to right.....	13
Muscular defects began in right.....	10
Muscular defects began in left.....	2
Convexity to left.....	8
Muscular defects began in right.....	2
Muscular defects began in left.....	3

Although there may be considerable difference in the height of the shoulders, immobilization of the corresponding part of the spine and other evidences of deformity, there is, as a rule, no special pain or discomfort. Should pain exist in an exceptional case there is no evidence that it is due to a meningitis. There may, however, be a certain degree of pain on pressure with stiffness of the affected portion of the spinal column. This may vary as to the time at which it is apparent, either early or late in the history of the affection. The curvature itself may be coincident with the earliest symptoms, but ordinarily it is apparent several years after the onset of the disease. In cases, such as one published by Bruhl, where the scoliosis was observed at the age of sixteen and a half years, but where the disease did not commence to be marked until the thirty-third year, we may fairly question the relationship of the two. It is not possible in most cases to state the exact time at which the deviation occurred, since no pain is present and as it is not ordinarily noticed until actual deformity appears.

The nature of deviation of the vertebral column as observed in syringomyelia has given rise to various opinions. Roth believes that scoliosis is of muscular origin, arising from an atrophy of the "muscles transversaire epineux," which may exist early in the case. We have noted

in a study of cases given in the appendix that atrophy of the trapezius (cucullaris) is rather frequently noted. The origin of this muscle embraces the entire extent of the spinal column above the first lumbar vertebra, and it can readily be understood how atrophy of it or of any considerable portion of its fibres may affect the direction of the spine.

It is quite probable that the muscles are not alone in their influence in causing deviation of the spine in this disease. The tendency to affections of the joints and of the long bones in syringomyelia would suggest that the vertebræ and their articulations may share the trophic change, which is more evident in other localities, so that we may hold, in view of the facts that have been presented, that the scolioses or the more pronounced deformities are evidences of trophic disorder dependent on the changes in the gray matter of the cord. In this respect we see in it a strong analogy to the spinal deviation observed in Friedreich's ataxia.

(3) *Vasomotor Disturbances*.—These changes are commonly observed and give rise in some cases to considerable distress. The superficial circulation in the affected areas is disturbed, being either inadequate to proper bodily comfort or, on the other hand, by its excess giving rise to redness, swelling, and actual elevation of the local temperature. In the first instance a sluggish circulation is naturally attended with a chilling of the part and a cyanotic appearance of the extremity involved. The surface temperature is lowered and the patient may complain of a sense of cold. Subjective sensations of cold in cases where no objective symptoms are apparent are common, and in many cases these feelings are distributed over a large area. The patient complains of coldness of a limb or of a sense of cold water running down the back. On the other hand, the sensation may be of burning or smarting and may vary very much even in the same individual.

The skin itself quickly responds to external stimuli, so that a slight stroke along the skin of the back will leave a reddish line, which persists for some time after the stimulus has been applied. This feature is common in spinal disease under the name of dermographism or "*homme autographique*," and is therefore of diagnostic value only when taken in connection with other more characteristic symptoms. So also œdemas are noted in this disease and are distinctly of nervous origin. They are observed, when present, on the dorsum of the hand or in the lower part of the forearm. The "*tumeurs pateuses*" observed by Roth are doubtless of this nature.

Disturbances of the secretion of sweat are quite commonly observed, excessive in some regions while suppressed in others. The excess is generally observed in the anæsthetic areas. French writers, including Dejerine, Grasset, and Bruhl, and Schultze and Fürstner and Zacher, in Germany, have made interesting observations on this point.

(4) *Disorder of the Sphincters*.—These are rarely disturbed.

In the first case summarized in our appendix, that of Abbe and Coley, there was partial loss of control of the bladder and rectum, and before death

a violent cystitis ensued. In a case of Charcot's death was caused by a spontaneous perforation of the bladder following a simple ulcer. In a case of Oppenheim's also death was due to bed-sores and cystitis.

Incontinence of the bowels is rare but constipation is commonly noted. In Preobrajensky's case (No. LXXIX.) there were retention of urine and incontinence of fæces; death occurred in the course of three weeks from pyelonephritis and purulent cystitis.

In traumatic cases, where great violence is done to the cord with accompanying paraplegia, we naturally look for incontinence of fæces and retention of urine. In Schlesinger's recently published case (No. XIV., Monograph, 1895) the above symptoms were present as a result of luxation of the twelfth dorsal vertebra with compression of the cord. At the autopsy, three months later, a dilatation of the central canal was found throughout the entire dorsal cord above the point of luxation. Cystitis and pyelonephritis were also present.

(5) *Ocular Symptoms*.—The disturbances of the eyes in syringomyelia may be properly considered under a separate heading, although they are closely related to the bulbar symptoms which will be more fully considered later.

Pupils.—Inequality of the pupils is not an uncommon symptom. In the one hundred and eighteen cases found in the appendix we find this noted twenty-seven times. (Cases III., V., X., XVII., XXVI., XXVII., XXXV., XXXVI., XLI., XLII., XLIII., XLIV., XLVI., XLIX., LVIII., LXIII., LXIV., LXXII., LXXIII., LXXVI., XCI., C., CV., CXIII., CXVI., CXVIII.)

In eighteen cases the right pupil was the larger; in six cases the left. Bruhl records this symptom ten times in thirty-six cases and Schlesinger twenty-four times in two hundred cases in all the literature accessible. By adding the cases of inequality of the pupils due to paralysis of the sympathetic the proportion rises to twenty-five per cent. Paralysis of the sympathetic nerve may occur from lesion of the cord in the upper dorsal region; it is generally unilateral, but bilateral paralyses have been recorded by Schlesinger, who remarks that it is one of the initial symptoms of syringomyelia, particularly of the cervical type and those that are accompanied by marked muscular atrophy. The pupils in almost every case observed reacted to both light and accommodation. In case No. LXXII. which we report convergence to light was absent. Immobility of the pupils with inequality is noted in a very few cases of syringomyelia as well as tumors of the spinal cord. The case of Oppenheim (G. P.¹) is an example, and other cases have been recorded by Glaser, Schultze, Homen (*q. v.*), Bruttan, and Tornow.

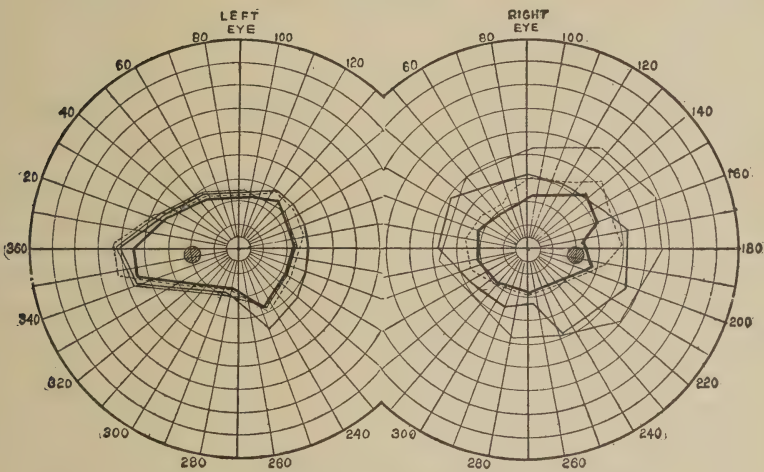
Nystagmus is not an unusual symptom. We find that it is noted fifteen times in one hundred and eighteen cases, and is usually horizontal, but may

¹ Archiv für Psychiatrie, 1893, p. 324.

be vertical or diagonal. It is one of the earlier symptoms, and is indicative of lack of muscular tone and co-ordination of the motor apparatus of the eye. In this respect it is entirely comparable with the nystagmus of Friedreich's disease.

The visual fields are occasionally narrowed. This was noted in the case of two men in a total of seventy-three men, and in five women in a total of thirty-eight women. French authors believe that this symptom is confined to cases complicated with hysteria, but this statement may fairly be questioned. The two cases which have been reported by Eskridge have been very carefully studied in this respect, and both showed narrowing of the visual fields. Neither of these could be construed as hysterical. Especially in the case of one of them (George S.) was this considered and ruled out. On roughly testing the eyes there was "an apparent approach to left lateral homonymous hemianopsia," but by repeated careful tests with the aid of the perimeter (see accompanying figure) it will be seen that while

FIG. 20.



Contraction of the color-fields in a case of syringomyelia.

all fields are lessened, the left eye showing the greatest contraction, there is not a condition of hemianopsia. Two examinations were made thirty-nine days apart. Schlesinger cites twenty cases occurring in more hysterical subjects where there was narrowing of the visual fields and sixty-seven cases where the fields were definitely known to be normal. When narrowing does occur it is found chiefly in the color fields, particularly green. Scotoma has not been observed. The condition of the external ocular muscles is not commented on excepting in very few cases. In these convergent strabismus from early childhood was noted six times. (Cases XXXIII., XL., LIV., LXVII., LXXX., CXI.)

The ophthalmoscopic appearances when mentioned are usually negative. In Eskridge's second case, that of Jesse C. (No. XVIII.), the disk of

the right eye was of a grayish-white color, with a central physiological cup; its edge was sharp; the sclerotic ring was seen around the disk rather more clearly on the temporal than on the nasal side. Two small pigment deposits were seen in the upper inner quadrant of the fundus about the diameter of the disk from its margin. The fundus of the left eye presented very much the same picture as that of the right, both having the appearance of commencing gray atrophy. The color-fields of these eyes are published in "International Clinics," 3d Series, vol. iv. p. 135.

In rare cases amblyopia or even amaurosis from atrophy of the optic nerves has been recorded.¹

(6) *Bulbar Symptoms*.—The invasion of the medulla oblongata by the glioma or by the formation of a cavity gives rise to a distinct train of symptoms. Among these laryngeal palsies assume a prominent place. Sensory paralysis of the larynx is somewhat uncommon, but motor paralysis is the form more frequently observed. The motor derangement consists more frequently in interference with phonation than in disturbances of respiration. Unilateral paralysis of the recurrent laryngeal branch of the pneumogastric is the commonest form observed. The paralysis is usually unilateral but in exceptional cases may be bilateral.

Where bulbar involvement is marked we have more extended paralysis of motion. The muscles of the pharynx, the tongue, the lips, and even the facial muscles may be involved. It thus happens in a well-marked case that the expression of the face is altered, owing to paralysis of motor branches of the trigeminus. The lips are unable to perform the act of suction, prehension; the patient is unable to whistle. Mastication is interfered with and solid food requires to be washed down with water; saliva becomes unmanageable owing to the difficulty in swallowing it. The motions of the tongue are impaired and its structure undergoes atrophy on one or both sides,—speech is thick.

Sensory changes, if sought for, will be found, in a typical case, to be present within the mouth, the throat, and the larynx, as well as the external portions of the body. In a case carefully studied by S. Solis-Cohen all the foregoing symptoms were found, and extensive sensory changes as well. While tactile sensation was almost perfectly preserved, it was found that at times there were places on the face, lips, and within the throat where it seemed blunted. The temperature sense was found to be both blunted and perverted on the right side of the face, while at the base of the tongue, in the œsophagus and the larynx, it was blunted but not lost. Taste was absent from the anterior portion of the tongue in the distribution of the gustatory branch of the nerve.

Other bulbar symptoms, such as vertigo, attacks of transient blindness, etc., may be noted, as has been recorded in the case referred to.

¹ See cases recorded by Simon, Schultze, Westphal, Furstner and Zacher, Eickholt, Glaser, and Schuele.

Laryngeal symptoms are generally gradual in their onset and pursue a chronic course. Should, however, bulbar manifestations occur suddenly by apoplectiform attacks they would probably be of a hemorrhagic nature, and would be accompanied by vertigo, clouding of the mind, and even complete loss of consciousness, possibly with vomiting. This symptom might mark the extension of the glioma into the brain if accompanied with severe headache. Disturbances of hearing, of central origin, and the occasional appearance of polyuria may be added to this group of symptoms.¹

3. *Symptoms of Posterior Poliomyelitis*.—Degeneration or excavation of the posterior horns of the cord gives rise to the most characteristic symptoms of syringomyelia. Disturbances of sensation are among the earliest features which can be traced in the history of most cases, and careful inquiry will almost always reveal incidents depending on the loss of pain sense or heat sense that antedate by several years the symptoms which lead a patient to consult a physician. But sensory disturbances are not always apparent. There are exceptional cases in which such unusual variations from the classical type have been present that the most accomplished clinicians have been led into error. It was just in this respect that Raymond was led into a mistaken diagnosis of a case, for it was only during the last fifteen months of the patient's life that any sensory changes were found although carefully searched for. Rare cases of this kind, in which during the entire course of the disease no sensory changes have been noted, are recorded by Schuele, Schültze, Krauss, Strümpell, Bernhardt, and Parmentier.

In a case recently reported by Schlesinger (Case VI., Monograph, 1895), a woman, aged thirty-nine years, presented no loss of sensation in any form. The pressure sense, localization sense, pain sense, and temperature sense, for both warm and cold, were normal; there was, however, hyperæsthesia and hyperalgesia. The clinical diagnosis of syringomyelia was made by both Schlesinger and Ewald on the strength of other symptoms. Death followed a surgical operation, and a cavity extending from the lumbar region throughout the entire dorsal and cervical regions was demonstrated at the autopsy.

The forms of anæsthesia which require investigation in a suspected case of syringomyelia are as follows:

Thermo-anæsthesia (almost invariably present).

Analgesia (generally present).

Tactile anæsthesia (rarely present).

Loss of muscular sense (rare).

¹ See articles by Herman F. Müller, A. Raichline, S. Solis-Cohen, H. Schlesinger, Klebs, Krauss, Grasset, and Adolf Schmidt.

The author would also call attention to the extraordinary statement by Dr. Frederick I. Roberts (Theory and Practice of Medicine, Ninth Edition, 1894, p. 1108) that there is no bulbar involvement in syringomyelia.

Loss of pressure sense (rare).

Loss of localization sense (rare).

It is quite unusual to find present in any given case thermo-anæsthesia, analgesia, and tactile anæsthesia, a condition conveniently expressed as triple anæsthesia. The symptom complex, which is considered almost pathognomonic of the disease, is a combination of thermo-anæsthesia and analgesia with preservation of tactile sensation. This constitutes the famous "dissociation symptom," as Charcot has designated it.

This dissociation of sensibility is not confined, however, to syringomyelia; it is found in the case of several affections of the nerve-centres, very frequently, for example, in cervical pachymeningitis; occasionally in neuritis, hysteria, alcoholic neuritis, traumatic neuritis, leprosy, hæmatomyelia, locomotor ataxia, and extramedullary tumor of the cord; and in mixed cases where there is injury both to the cord and to the nerve-roots. Two cases illustrative of the latter condition, in which the dissociation symptom was well marked, have been recently published by Lloyd, under the title of "Traumatic Affections of the Spinal Cord simulating Syringomyelia."¹ In the first of these cases a man, in falling from a scaffold, struck the back of his neck, and was believed to have sustained a fracture of the spinal column. The entire body, including both arms and legs, was paralyzed. He recovered from this, and eight years later he fell again and struck the back of his head and spine between the shoulders. Partial recovery took place, but an examination ten years afterwards revealed to some extent the dissociation symptom. There was anæsthesia to cold; cold objects in the affected area, as shown in the charts (Figs. 2 and 3, *loc. cit.*), were called hot. Analgesia of the right side was present, while tactile sensibility was everywhere good.

In a second case a laborer, at the age of thirty, injured his cervical and dorsal spine by having fallen into a canal and being jammed between two canal-boats, and was unable to resume work for three months. At the age of fifty-seven he was severely injured by a fall of a bank of earth. After twenty-four hours' unconsciousness he was found to be paralyzed in the left arm and leg. Three years later an examination showed, in addition to angular deformity of the spine, atrophy and fibrillary contractions of the left shoulder girdle muscles, a noteworthy disorder of sensation. (See Figs. 5 and 6, *loc. cit.*) The patient was unable to distinguish heat from cold or to recognize either in the region marked on the chart. The thermo-anæsthesia was on the right side, the side opposite the paralysis of motion. There was an area of tactile anæsthesia (not portrayed on the chart) involving the right leg.

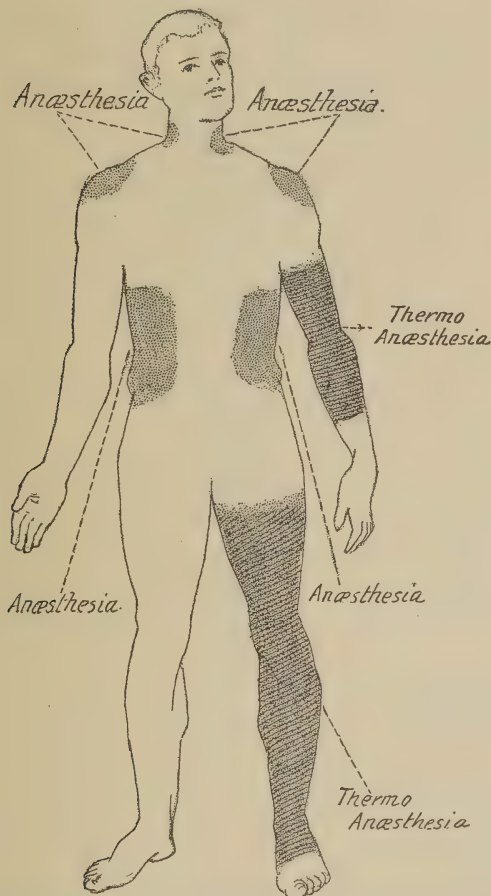
It may be possible that in these cases where trauma has played such a conspicuous part the conditions may be explained by the subsequent discovery of hæmatomyelia and consequent excavation, the "myelite cavitaire"

¹ Journal of Nervous and Mental Disease, June, 1894.

of French authors. However this may be, this author did not feel justified in making a diagnosis of syringomyelia, in these cases at least, in the present stage of their clinical manifestations. On the other hand, it is quite likely that in less careful hands a positive diagnosis would be claimed.¹

Thermo-Anæsthesia.—Loss of power to recognize heat and cold is probably one of the earliest symptoms; it is a prominent feature all through the history of the majority of cases, although varying considerably in its extent

FIG. 21.



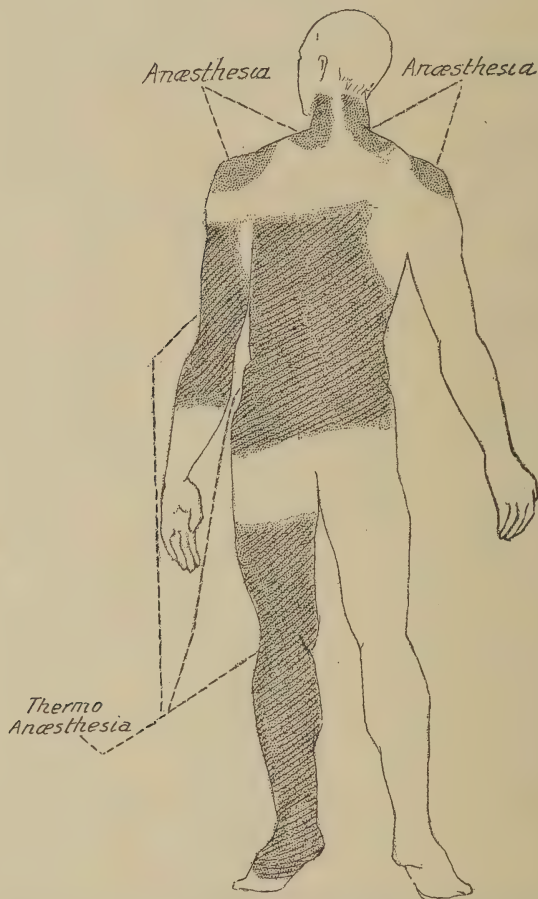
SYRINGOMYELIA.—Showing segmental distribution of sensory symptoms.

and in its degree in individual instances. It is most commonly found in the hands and fingers of one side, or it may extend throughout one or both upper extremities, or be in a measure present throughout almost the entire area of the body. Thermo-anæsthesia is commonly limited by the median line of the body, and in these cases where both upper and lower quadrants are involved is sometimes described as hemiplegic thermo-anæsthesia.

¹ See, also, a publication by R. Verhoogen, entitled "Dissociation de la Sensibilité dans un Cas de Lésion des Nerfs du Plexus brachial." Brussels, 1894.

The line of demarcation between the normal and abnormal area is generally quite sharply drawn; particularly is this the case on crossing the median line from the affected to the unaffected side.

FIG. 22.



SYRINGOMYELIA.—Showing segmental distribution of sensory symptoms.

In its distribution, thermo-anæsthesia sometimes involves the face (ascending branch of the fifth nerve); more often it affects the sides and back of the neck and is likely to be limited by the hair of the scalp behind (distribution of the occipitalis major and minor). It is obviously more likely to be discovered in the exposed areas of the skin, but on careful exploration areas on the thorax, horizontal belts in the abdomen, or possibly areas in the outer aspects of the thighs may be discovered. Charcot associates its distribution rather oddly with the names of garments for the various localities; thus he makes out the “forme de gant, de manchette, de manche, de bas, de culotte, de jambe de pantelon, de petite veste,” etc. The distribution is sometimes symmetrical; it is usually progressive in character.

To elicit information in a suspected case of thermo-anæsthesia it is customary to use two test-tubes of precisely similar form and appearance, one containing hot water and the other cold. It is preferable to use a small object like a test-tube instead of a more bulky bottle, for the reason that normal skin areas adjacent to the affected regions may be sensible to radiation of heat from a larger mass. The wide difference of temperature present in the tubes at the start tends to grow smaller as the examination progresses unless precautions are taken. It is therefore desirable to know, by using a thermometer, the exact temperatures of the testing apparatus. Charcot used a surface thermometer, the bulb of which was inclosed in a metallic cylinder filled with copper filings. By these means the temperature acquired on placing the instrument over an alcohol-lamp may be maintained for a considerable time. (See also article by Leegaard.) Glass balls provided with a perforated cork for the passage of a thermometer and half filled with water may be used.

The glass ball can readily be heated in an alcohol flame as far as 212° F. Great care should be used in tests with temperatures above 180° F., as too long a contact might produce burns, the healing of which would be troublesome.

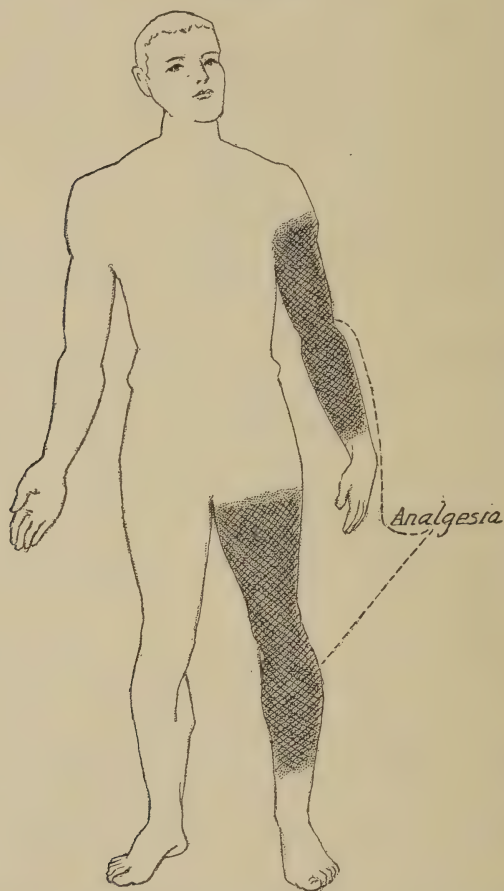
Thermo-anæsthesia may be said to be complete when the patient fails to recognize either ice when placed on the skin or an object heated to near the boiling point. Such extreme loss of temperature sense is not commonly met with, and the recognition of intermediate grades becomes necessary in most cases. Any one who fails to distinguish differences of 5° C. or 9° F. may be said to have thermo-anæsthesia (Roth). There is need in difficult or doubtful cases to make numerous examinations with relatively slight differences of temperature, especially in the moderate ranges between 80° and 140° F.

Normal individuals vary very greatly in their acuity of perception, and the time reaction varies in different cases. So also allowances must be made for the natural variations of acuteness of sensation in various parts of the body. According to Weber and Nothnagel, 40° C. can be distinguished at the finger-tips in favorable subjects; such fine differentiation is wholly impossible without the most delicate and reliable instruments, and would fail in persons whose perceptive powers are normally more sluggish. It is also shown that at extreme temperatures at either end of the scale slight differences are not so readily recognized as at the more moderate ranges. High temperatures may be recognized simply as painful if test is made in the back, the thorax, etc., while at certain sensitive points, as, for instance, the finger-tips, they may be recognized in their true character. In other cases the sense is perverted, giving rise to hyperæsthesia or complete reversal of the sense of heat and cold. In one of Bruhl's cases the skin of the right half of the thorax was sensitive to thermic impression in an exaggerated manner.

The application of tests of various degrees of cold is not quite so easy

on account of the difficulty in securing a series of different temperatures below that of the surrounding air. On this account abnormalities in the sense of cold are doubtless frequently overlooked. Error in the estimation of the degree of thermo-anæsthesia is liable to happen by reason of daily, and, it has been suggested, by hourly variations in the areas of distribution and in the intensity of sensation. Such cases are recorded, and serve to explain discrepancies which arise in clinical studies.

FIG. 23.



SYRINGOMYELIA.—Showing segmental distribution of sensory symptoms.

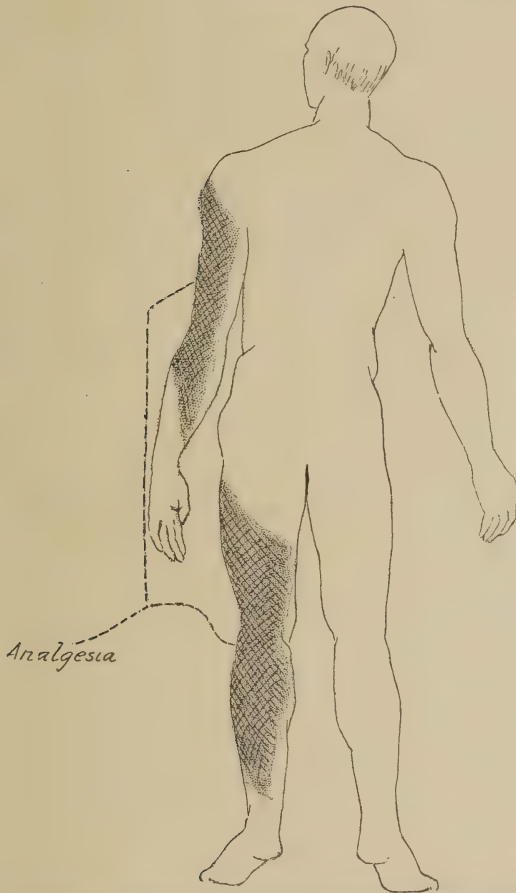
In general the same regions that are insensitive to heat are also insensitive to cold, but one area is not always exactly superimposed upon the other, and this fact had led to the belief in the probability of the existence of special nerve elements for the transmission of the sensations of heat and of cold. Cases are cited in which warm objects are recognized over certain areas, while cold objects are not recognized in the same location.

It should be mentioned in connection with thermo-anæsthesia that the

mucous membrane occasionally is involved as well as the cutaneous surface.

Analgesia.—Loss of the sense of pain in certain areas is one of the cardinal symptoms of syringomyelia. In its distribution it occurs in general in the same areas as in the case of thermo-anæsthesia. (Figs. 23 and 24.) It may be of various degrees from partial to absolute loss of pain sense. The prick of a pin is not recognized as painful. So profound is the anal-

FIG. 24.



SYRINGOMYELIA.—Showing segmental distribution of sensory symptoms.

gesia in some cases that abscesses have been opened and even fingers amputated and joints excised without a particle of pain. As we have previously mentioned, fractures may occur without any pain being felt. On the other hand, in exceptional cases hyperæsthesia has been recorded in place of analgesia. Charcot explains this by conceiving that the period of destruction of the nerve elements is preceded in some way by a period of irritation. Hyperæsthesia, when present, is more likely to be found in the lower extremities.

In estimating the degree of analgesia it should be borne in mind that individuals of the same class at different times vary greatly in this regard, and still more noteworthy is the difference between different classes of subjects. The subject of dermal pain has been investigated by Mr. Griffing, of Columbia College, New York. He shows that in kilogrammes the required amount just causing pain was as follows:¹

	Kilogrammes.
For boys	4.8
For college students.....	5.1
For law students.....	7.8
For women.....	3.6

II. *Extrinsic Symptoms*.—Symptoms due to

1. Sclerosis of the lateral columns.
2. Sclerosis of the posterior columns.

These symptoms are due to alteration of the white substance of the cord, and have been termed by Charcot “symptomes leucomyeliques.” They are naturally late in their manifestation, and indicate that the glioma has passed, in its influence, beyond the bounds of the gray matter, and that it or the resulting cavity intrenches on the lateral or posterior or other columns by pressure or actual degeneration.

1. Lateral sclerosis is recognized by well-known motor symptoms. Symptoms of spastic paralysis may be of all grades from moderate paresis with some stiffness to the complete stage where contracture supervenes. An early indication of this change is an exaggerated knee-jerk, and in an advanced case the addition of ankle-clonus. In sixty-one cases out of one hundred and eighteen the knee-jerk was plus.

Spastic symptoms were noted in our list of one hundred and eighteen cases in eighteen instances.

2. Symptoms due to sclerosis of the posterior columns or tabetic symptoms are thought to be more common than the spastic symptoms. The well-known distinguishing signs are motor incoördination, defective station with eyes open or closed, lancinating pains, and loss of knee-jerk. We have noted tabetic symptoms in nine cases out of one hundred and eighteen. In a later chapter on the forms of syringomyelia we will refer to this subject again. In one hundred and eighteen cases the knee-jerk was absent in six, diminished in four, normal in twelve.

Tactile Sensibility.—This is, as a rule, preserved in syringomyelia, and constitutes, by its presence and by the absence of pain and temperature sense, the well-known “dissociation symptom.”

In some analgesic areas there is occasionally observed a lowering of the tactile sense,—hypæsthesia. This is tested by noting whether there is any deviation or disappearance of the appreciation of ordinary contact, of tactile

¹ Transactions of the American Psychological Association, December, 1894.

pressure, of simultaneous tactile pressures, of the appreciation of outline (relief), and of the tactile perception of liquids.

Absolute tactile anæsthesia is altogether exceptional, but, of course, where complications are present involving the white matter of the posterior columns, we naturally would expect disturbances of tactile sensation. The allied forms of sensation, the muscular sense, pressure sense, localization sense, etc., are almost always preserved in syringomyelia. It has been claimed that in some cases the sensation of skin pressure was entirely absent or at least very much diminished, while the deeper pressure sensation was normally preserved.

The Paths of Sensory Impressions.—This subject opens a very interesting field for investigation, and one where many discoveries are yet to be made. Investigations that are purely anatomical and physiological bearing upon this subject have received considerable aid from the clinical study of syringomyelia. It is a subject that also interests the psychologist. There seems to be a general agreement that the nerve fibres for the conduction of pain and temperature run in different tracts from those that conduct ordinary tactile sensation. Professor Schiff has always maintained that the gray matter conducted thermal and painful sensations, while the posterior columns conducted the tactile and muscular sense. Brown-Séquard differentiates this further, declaring that the central part of the gray matter serves for the conduction of the sense of temperature, its posterior and lateral parts for that of pain, while the posterior columns of the cord convey tactile sensibility, all three forms previously decussating in the median line. Gowers says that after decussation in the posterior commissure, the fibres subserving sensibility to pain pass upward on the antero-lateral ascending tract, and that those subserving temperature probably pass up in their immediate vicinity. Gowers quotes a case of injury to the cord in the upper cervical region involving the lateral column and gray matter, as the result of which there was an entire loss of sensibility to pain on the side of the body opposite to the lesion without any loss of tactile sensibility. "Experiments seem to show that tactile sensibility is conducted by the posterior columns, and the integrity of these latter, especially in the earlier stages of the disease, would account for its retention in some cases."

ETIOLOGY.

Sex.—Males are far more liable to syringomyelia than females. Out of one hundred and ninety cases, one hundred and thirty-three were in males and fifty-seven in females, or seventy per cent. and thirty per cent. respectively. The explanation of this is no doubt the influence of trauma in developing an innate tendency to the disease, or in producing directly pathological conditions in the spinal cord, which are followed by glioma and cavity formation.

Age.—The influence of age is probably active in great measure, as per-

mitting occupations and exposure to accident, etc., which act directly. The following table shows the frequency in the different decades of life as collected by Schlesinger:

Age.	Male.	Female.	Total.
1 to 10	4	1	5
11 to 20	36	8	44
21 to 30	53	25	78
31 to 40	30	12	42
41 to 50	4	7	11
51 to 60	3	3	6
61 +	3	1	4
	133	57	190

The decade in which the disease is most frequently observed is that of twenty-one to thirty years. There is a tendency to a somewhat later development of the disease in women than in men. One case of Schlesinger's (Obs. xvi.) occurred in a woman aged seventy-eight years.

Occupation.—The vast majority of cases occur in those who live by manual labor. Overwork is frequently noted.

Trauma.—A large number of cases are apparently the result of injury, particularly to the back. We may mention particularly cases of Oppenheim, Strümpell, Sinkler, Stadelman, Minor, Sokoloff, Silcock, Harcken, Bikeles, Alexis Thomson, and Eskridge.

It may be said in this connection that Eickhorst found in experiments on animals in which the cord had been divided or injured that cavities formed frequently in the posterior columns, and sometimes extended into the central canal.

In cases in which the syndrome in syringomyelia becomes suddenly present, especially when we have a history of a recent trauma, we may naturally suspect the existence of hæmatomyelia, since hemorrhages of the spinal cord principally affect the central portion,—i.e., the gray substance.

The production of glioma in consequence of trauma requires a considerably longer time. It is quite likely that traumatic hemorrhages of the medulla may evolve hemorrhagic cysts, which would then have compact surrounding capsules of connective tissue, and might form the starting-point for central gliomatous degeneration. Such a pathogenic process may also occur when the central hemorrhage is not induced by trauma. In four cases, in which the organic lesion of the spinal cord undoubtedly resulted from trauma, Minor found many symptoms closely resembling those occurring in syringomyelia: for instance, the characteristic dissociation of sensibility. As the patients in question are still living, the diagnosis has not been confirmed. In a fifth case of traumatic hæmatomyelia death occurred after several days. The autopsy revealed a tubular hemorrhage throughout the entire gray axis of the spinal column.¹

¹ Archiv für Psychiatrie, vol. xxiv.

The accompanying figure shows the arterial circulation, for the cervical (C), dorsal (D), and lumbar (L) regions of the cord.

How far excess in alcohol and exposure to cold and dampness are factors in the production of the disease we cannot say. These influences are probably of small moment. It has been noted by Verhoogen and Vandervelden.

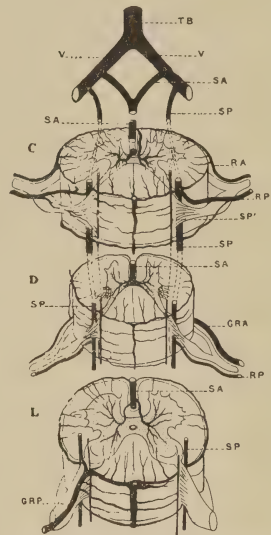
Infectious Diseases.—These have a distinct predisposing influence. The following diseases have been observed in the previous history of subjects of syringomyelia:

Syphilis (cases of Simon, Schuele, Neuhaus (Obs. i. and v.), Tornow); rheumatism, arthritis deformans (Klemm); typhoid fever (Bruhl, Bernhard, Freund, Westphal, Schüppel, Sokoloff, Schultze, Remak); tetanus (Knoppek and Meyer); variola; erysipelas of the head; chronic chorea (Duchenne and Hoffmann); Basedow's disease (Joffroy and Achard); pachymeningitis chronica (Rosenblath, Schmaus, Francotte); myelitis (Leyden); anterior poliomyelitis (Kahler and Pick); Friedreich's disease (Friedreich and Dejerine, Letulle).

Heredity.—In two instances syringomyelia seems to have assumed a family type. Verhoogen and Vandervelden report the disease occurring in two sisters and a brother. In an autopsy on one of these cases the anterior and posterior horns were found intact; the central canal, of an oval form with the long axis transverse, was found with its aperture closed and the cavity full of granular exudate and cells with gray nuclei and with cellular *débris*. In the mid-dorsal region there was sclerosis of the external part of the lateral column and of the columns of Burdach and Goll. The canal was the same as in the cervical enlargement. In the lumbar region there was sclerosis of the postero-internal part of the anterior column, and in the whole extent of the lateral column and the anterior portion of the column of Burdach alteration of the canal, most marked in the upper portion.

Dr. Andrea Ferrannini has recently described four cases in one family, including two brothers, Nicola and Francesca, their sister Marta and mother Benedetta. At different times all four have sought medical advice for the same affection. Panaris, paræsthesia, and special forms of dysæsthesia, limited to a single upper extremity or abscess, developed without any apparent cause; felons developed in the left thumb of the two brothers, in the right thumb in the mother, and in the right index-finger of the sister Marta. In Nicola, Benedetta, and Marta the swelling was followed by necrosis and complete destruction of the last phalanx in each case. In the

FIG. 25.



Arterial circulation in the spinal cord. (Brissaud.)

fourth patient there was no necrosis. In all four patients the incision of the swelling by the physician at different times gave exit to a very small quantity of pus or sometimes only to blood. Marta felt neither the incision nor the extraction of the dead bone, much to the wonderment of onlookers. These manifestations occurred in two of the cases, Nicola and Marta, between the thirtieth and thirty-fifth years, and in the others at about the fiftieth year.

Panaritias were observed in all four patients, and the ulceration with acute œdema or pseudophlegmon of the forearm were noted in Nicola. There were marked vasomotor changes. Appearance of erythromelalgia in Francesca's left hand. These appearances would subside at times and the hand would suddenly become white and cold as though dead, then painful at times, constituting an acrodynia and an acroparæsthesia, hyperæsthetic rather than anæsthetic. Disordered sensation to temperature. Heat was recognized as cold and *vice versa*. Formication in the calves of the legs, ankles, sole of the foot or shoulder, chiefly on the left side of the body. Burning, or a sense of cold, in the first three fingers of the left hand or in only one, particularly the ungual phalanx of the thumb. Frequently at times a painful sensation as from many pins pricking, or stings of bees. Also a curious sensation in the ball of the thumb. These sensations precede an attack of erythromelalgia. The sensations were likened to the action of a file or the gnawing of an animal; the pain was deep and either intermittent or intensifying towards a crisis. The pains were like those of syphilis except that there was no nocturnal exacerbation and no increased pain on pressure.

A little ice in contact with the thumb gave the sensation of intense heat; a temperature of 5° C. was felt as hot; at other points of the body gave the sensation of contact only. On the other hand, there was complete loss of heat sense, even when tested to 100° C.

Fibrillary twitchings present.

Varieties.—The great diversity of forms of syringomyelia renders a classification desirable. We may have types as follows:

1. Atrophic or anteropoliomyelitic.
2. Spastic and amyotrophic lateral sclerosis.
3. Sensory (posterior and median poliomyelitic).
4. Type Morvan.
5. Lumbar type.
6. Unilateral type.
7. Bulbar type.
8. Anterior leucomyelitic or posterior leucomyelitic.
9. Latent form.
10. Non-typical cases.

Clinically, we may say that there is a gliomatous form beginning early, —between the ages of fifteen and twenty-five. At quite an early period cicatrices from painless burns are found, marking the early appearance of

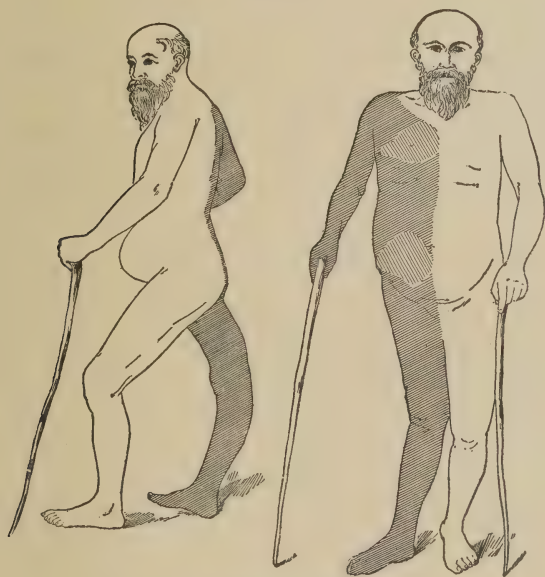
thermo-anæsthesia. In other cases amyotrophy is one of the earlier signs. The early stage is long, but steadily progresses.

In the myelitic form the onset is later in life; it has less tendency to progress, and may remain completely stationary. For example, in a case of Charcot's, the early symptoms, appearing at the age of forty years, assumed a paraplegic form, with cervical location, with amyotrophy, and with sensory and trophic disorders. These developed rapidly at first, and then remained stationary.

Type Morvan.—Morvan and Dejerine still claim for this affection a distinct identity, but most authorities classify it as a type only of syringomyelia. An argument for its identity is found in the apparent tendency of the disease to occur frequently in certain localities. This has been taken to indicate a toxic origin.

Gombault's case, in which he found in a patient with Morvan's disease a peripheral neuritis with slight sclerosis of the cervical cord, lends some probability to this theory; but it has lately been shown that peripheral neuritis may occur in syringomyelia as well as Morvan's disease, and that cavities in the spinal cord may occur in well-marked cases of the latter affection.¹ (Joffroy and Achard.) Thus Morvan's disease is held to be only a special clinical form of syringomyelia characterized by predominance of panaris.

FIG. 26.



Unilateral gliomatosis.

Unilateral Gliomatosis.—It is not unusual for the gliomatosis to be confined to the entire gray matter, or to a single half of the spinal cord. Such irregularities naturally give rise to difficulty of diagnosis. (See Fig. 26.)

¹ Soc. Méd. des Hôpitaux, 1890 and 1891.

(The author is indebted to Dr. Charles K. Mills for the use of this figure, taken from his work on "Nervous Diseases," in press.)

(Cases of Oppenheim, Rossolimo, and of Dejerine and Sottas and Weintraud are of this variety.)

The bulbar type has already been considered.

Tabetic Type.—This type arises from a combination of tabes with syringomyelia, or by an extension of the gliosis to the posterior columns. Such cases are not unusual, and have been recorded, among others, by Redlich, Eisenlohr, Nonne, Senator, Mann, Rosenblath, Jegorow, Schüppel, Schlesinger (Obs. xii.).

In a recently published case of Oppenheim's (*Archiv für Psychiatrie*, vol. xxv.) a man, aged forty, had for a long time an affection characterized for the most part with signs of tabes (unsteadiness of gait, and, with eyes closed, increased sway). The knee-jerk was absent on the left side. There were troubles of sensation, with dissociation of tactile sensibility and thermic and pain sense, and scars on different portions of the skin. The subject, who had kypho-scoliosis, was weak-minded, and had ideas of grandeur, etc. Dementia paralytica. Death ensued, and at the autopsy diffused glioma of the spinal cord and gray degeneration of the posterior columns were found. Chronic cerebral pachy- and leptomeningitis were found, dilatation of the ventricles, atrophy, and gray degeneration of the nerves and optic fibres (bandelettes). Central gliomatosis of the cord and posterior fascicular degeneration.

Glioma of the lower cervical enlargement extending through the dorsal cord to the lumbar enlargement.

In the mid-dorsal region the entire gray substance was involved. In the lower part and in the lumbar region the gliomatous product was confined to the left half of the cord.

(To be concluded.)

PREPARATION OF FROZEN SECTIONS BY MEANS OF METHYL AND ETHYL CHLORIDE.¹

BY HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania.

IN September, 1895, while watching Dr. John B. Deaver perform a minor surgical operation with ethyl chloride, the thought occurred to me that this reagent might profitably be employed in preparing frozen sections

¹ Preliminary report. Method demonstrated and sections exhibited at the meeting of the Philadelphia Pathological Society held December 10, 1896.

for histological purposes. The results thus far obtained have been exceedingly satisfactory, and, while the method is somewhat expensive, no accessory apparatus is required for the microtome.

Hamilton's method of preparing the tissues for freezing gives good results ("Text-Book of Pathology," by D. J. Hamilton, vol. i. page 58). Another way of getting the tissue ready is that recently advised by J. Orth (*Berlin. klin. Woch.*, No. 13, 1896),—one hundred parts of Müller's fluid are mixed, when wanted, with ten parts of formol. Small pieces of the tissue under examination are fixed and hardened in this solution in the incubator for three hours. At the end of this time they are removed and thoroughly washed, and alcohol is gradually added until they are placed in ninety-five per cent. alcohol. This latter reagent must, of course, be removed before the tissue is frozen. If desired, after washing, the specimen may be at once transferred to the solution of acacia and sugar and frozen. Or, as suggested by H. Plenge (*Virchow's Archiv*, vol. cxliv. page 409), the pieces may be placed in a four-per-cent. formaldehyde solution for a quarter of an hour, and then frozen in the same solution.

When the tissue has been prepared in some such manner, or even when perfectly fresh, it is placed with some formol and gum acacia fluid upon the specimen-holder of the microtome, and a small stream of ethyl chloride, methyl chloride, or anesthetic (a mixture of these two reagents) is played from above directly upon the specimen. The tube containing the ethyl chloride is held about a foot from the specimen, and moved from place to place until the specimen is firmly attached to its base of support, and the upper portion is coated with a few crystals of ice. These crystals are extremely small and delicate, and, therefore, do not injure the tissue so markedly as in some other of the freezing methods. The specimen is readily frozen in from thirty seconds to a minute. Sections are then cut and placed in water or fifty-per-cent. alcohol, and mounted in the usual way. Excellent stained preparations may be prepared in fifteen minutes or less from the time that the tissue is removed from the body.

A fuller report, with photomicrographs of tissues prepared by this method, will be presented in a later communication.

CLINICAL LECTURES.

CONSIDERATIONS ON THE RELATIONSHIP BETWEEN THE VEINS OF THE HEAD AND NECK AND THE PATHOLOGY OF THE PARTS.

A LECTURE DELIVERED AT TUFTS COLLEGE MEDICAL SCHOOL ON OCTOBER 28, 1896.

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Assistant Professor of Surgical Pathology, Faculty of Medicine, Tufts College, Boston, etc.

GENTLEMEN,—Wounds of the head and neck and contusions of the face and integuments of the cranium differ in no way from those found in other parts of the body. They are accompanied, perhaps, more than elsewhere by considerable hemorrhage on account of the large number of veins which cover the head.

Thus we find that contusions of the head form more or less large tumors, which contain blood and are known under the name of sanguineous bosses. But the most interesting part of the question relates to the complications which follow, such as erysipelas, abscess, and diffuse phlegmon.

The head is a region of predilection for erysipelas. The various traumatisms, with solution of continuity of the soft parts, and the fact of the wounds being exposed to the influence of the pathogenic agents of the exterior, are eminently favorable causes for the evolution of this affection. The face is remarkably predisposed to erysipelas, and is more often the seat of this disease than the scalp. In fact, it is not rare to see an erysipelas of the scalp the result of the extension of the affection from the face, and it is even the most common way of progression.

When limited to the face, erysipelas is not a serious disease; in some cases, however, it has ended in death of the patient. But these cases are rare, and it may be said that the malady only becomes serious when it invades the scalp. When this occurs a very intense delirium takes place, seeming to indicate that the disease has invaded the brain and its envelopes.

Now, how can we explain this extension of the erysipelatous inflammation? If you will recollect the various vascular communications existing between the interior and the exterior of the cranium by intermediary of the diploic canals, this question is quickly settled. The inflammation, which is first limited to the face, reaches the venous branches of the scalp, and this phlebitis is propagated through the numerous vessels of the diploë, and

thus it extends over a considerable surface of the brain and meninges. It has been said that this extension could take place by the vessels of the orbit. If this is possible, it appears at least more difficult. Now, erysipelas of the orbit is simply a facial erysipelas, and it is just these cases which are limited to the face that rarely produce death and do not cause cerebral complications.

By the same fact abscess and diffused phlegmon of the head following traumatism or an erysipelas may be the cause of a meningo-encephalitis by causing phlebitis of the veins of the diploë. Let me add, also, the extension of phlegmon to the subperiosteal layers of the bones, and from there continuing to the bone itself; thus they may become the starting-point of a pyæmia and purulent infection.

An ordinary boil on the face or a scratch on the nose is sufficient to start up an erysipelas of the face, especially if the subject is in a locality in which the disease is present, and this erysipelas may in its turn give rise to a phlebitis of the facial vein, which extends to the ophthalmic vein, and becomes the starting-point of a thrombus of the cavernous sinus, or of a meningo-encephalitis, finally resulting in death. We still find in the practice of surgery cases of this description.

Now, what practical conclusions can we draw from what I have said? The first is that every wound of the head, no matter how small, should be treated with the greatest care, in order to avoid the unfortunate complications to which it may give rise. After having arrested the hemorrhage by compression over the wound, the latter should be washed thoroughly with an antiseptic solution in order to remove all foreign substance which it may contain; and every time that it is possible we will endeavor to secure union by first intention and afterwards apply an occlusive dressing. J. L. Petit has mentioned as a cause of erysipelatous inflammation of the wound and its neighborhood, the introduction of hair into the solution of continuity; in wounds of the integuments of the cranium it is consequently decidedly indicated to shave the hair to a large extent around the wound.

There is a special variety of wounds of the integuments of the cranium which, nevertheless, belongs to contused wounds; this is the lesion resulting from projectiles of war. The border of wounds produced by fire-arms should be shaven as in any other case, the contusion of the tissues being always very severe, and thus in the greater number of cases the formation of an eschar, which will be eliminated, will occur; and in these cases reunion by first intention should not be tried; you will simply cover them with an antiseptic compress, which should be frequently changed in order to prevent infection.

If in spite of all these precautions erysipelas invades the wound, you should immediately commence a constant local spray of a solution of carbolic acid, and an internal administration of antiseptics, such as bismuth tribromophenolicum, salol, or naphthol. Incisions should be made in those parts which appear to be softened, although the pus may not have com-

pletely formed and collected; and when the treatment employed has not prevented suppuration from occurring you should open freely all the foci in order to give free issue to the liquid and thus prevent its stagnation and absorption into the economy.

I will now consider the wounds of the neck. The veins of the anterior group, which comprise the internal jugular vein and the anterior and posterior jugular vein, being only slightly protected by the soft parts, especially at their point of termination, are more easily accessible to vulnerating agents than those of the posterior group, which is made up of the posterior jugular and vertebral veins. On the other hand, being of considerable size, the gravity of wounds of the anterior group will be considerable on account of the enormous hemorrhage which may result. Being strongly united to the aponeuroses, which hold them gaping open, and being also more under the influence of thoracic aspiration than any other veins of the body, on account of being so near the heart, they may, when opened, easily allow the entrance of air; but the great richness of anastomoses which united them at their origins may explain why the surgeon can ligate a large venous trunk without fear of interrupting the circulation.

Traumatic lesions of the veins of the neck are not infrequent, and the most varied kinds of traumatism may produce them. Thus they may occur in cases of cuts from a knife, sword, or even lancet. You all know that bleeding from the external jugular vein was very frequent when bleeding was a common therapeutical agent. It is in these various cases that are observed clean, complete, or incomplete sections of the veins. Those of the internal jugular vein are to be particularly feared. Bullets and comminutive fractures of the lower jaw may determine very serious lesions of the veins of the neck. Stromeier reports a case in which there was ulceration of the internal jugular vein, produced by a piece of the lower jaw carried against it by a bullet. Poeckels and Fischer have reported a case of perforation of the jugular vein produced by a ball which became lodged near the gullet. Gross has observed a case in which a bullet, after having perforated one wall of the internal jugular vein, became lodged and encysted in the internal wall on the opposite side of the vessel.

Wounds of the neck are quite frequently met with during operations performed in this region of the body, such as tenotomy, etc., in cases of extirpation of certain cervical tumors necessitating, by severe traction on the surrounding parts, ligature of the arteries, especially during the efforts of the surgeon to denude the vessel and to separate it from the veins by which it is surrounded. Couty mentions a case of wound of the anterior jugular vein when a seton was passed; there was introduction of air into the vein. Nicaise mentions two cases of tear of one of the collateral veins of the internal jugular during enucleation of a tumor, which necessitated ligature of this large vessel on account of the extreme hemorrhage which resulted. And, lastly, let me remind you of the frequency of wounds of the inferior thyroid veins during the operation of tracheotomy.

All such lesions should be considered serious, but the gravity is in direct relation to the intensity of the traumatism, as well as to the extent of the lesion itself. In slight contusions a thrombus usually forms which sometimes becomes organized, thus definitely obliterating the vein; at other times it becomes absorbed and the vessel again becomes patent.

In incomplete sections of the veins, in contused wounds by fire-arms, the rapidity with which the clot forms assures a primary hæmostasis; the inflammatory process produced by the endophlebitis and periphlebitis rapidly ends in the formation of a cicatrix. Extensive denudations get well very easily when no inflammatory reaction occurs around the veins.

Such, gentlemen, are the phenomena which take place when the wounds are aseptic. But this is not the case when the wound is immediately infected by a septic body, or, secondarily, after necrosis of the walls or by want of proper care. The wound of the vein may then end in the most serious complications, such as extensive suppurating phlebitis, thrombosis, and embolus, purulent infection, pyæmia, and secondary hemorrhage.

Langenbeck has pointed out that wounds by gunshot especially, by the resulting singeing of the soft parts surrounding the vein, as well as the vein itself, may set up an inflammatory process which causes the clots to soften and break down, by which process they are detached from the walls of the vessel and produce secondary accidents. Among these ulterior complications I would mention hemorrhage, thrombosis, phlebitis, and pyæmia.

I would also mention that arterio-venous aneurism of the neck has often, in fact usually, a traumatic lesion of the internal jugular vein as a cause.

Let us now see what takes place when the traumatism is more violent, opening the jugular vein. Two principal and immediate symptoms occur; these are hemorrhage and entrance of air into the circulation.

The hemorrhage is generally of little importance when it takes place from a secondary vein. It consists in an oozing, and is easily arrested by a well-applied compression. If there is rupture of the large venous trunk and if the wound is narrow, the blood spurts out in a jet for a minute and then dribbles away. If it collects in the meshes of the cellular tissue it forms a venous tumor, which is known under the name of diffuse venous aneurism.

Primary hæmostasis is obtained in these cases by the formation of a clot or by a foreign body obliterating the vein. In contused wounds by fire-arms hæmostasis occurs rapidly on account of the ease with which the clot forms, owing to the irregular and ragged borders of the wound. Now, if the venous wound communicates freely with the atmosphere, hemorrhage is always abundant, sometimes to such an extent that death takes place. Primary hæmostasis with formation of the clot is in these cases very difficult if not impossible. Forcepressure should first be resorted to, and after the vessel is well secured it should be ligated.

Dussautour has demonstrated the efficaciousness and innocuity in cases

in which ligature has been performed, and it may be said that neither œdema nor cerebral accidents are to be feared, provided the carotid artery is not comprised in the ligature when the vein is tied. Thrombosis and phlebitis, which so frequently follow denudation of large vessels, are no longer to be feared.

Now, should we apply a lateral ligature in cases in which there is incomplete division of one of the veins of the neck? In reply to this I would say that on account of the great number of fatal results which have occurred when lateral ligation of a venous trunk has been performed it should be rejected, and that the proper practice is to immediately apply a circular ligature to the vessel. However, within the last few years Pilcher, of Brooklyn, has reported a few cases of cure after lateral ligation of the veins. From what this authority says, it would appear that lateral ligature should be employed for the external and anterior jugular veins, in which it is nearly always successful, and in a general way it should be applied for all incomplete wounds in all cases in which the gravity of the hemorrhage does not necessitate a circular ligature.

Now, gentlemen, no matter what kind of ligature you may attempt, your catgut or silk must be absolutely aseptic, in order to avoid fatal septic complications. Let me say that a circular ligature should always be placed on both ends of a cut vein, because on account of the absence of valves and the thoracic aspiration the blood may flow out from the lower end and air enter into the vessel.

Another very serious complication is the introduction of air into the circulation. When this accident occurs a whistling, gurgling sound is heard, caused also by a syncopal condition of the patient. In some cases a spumous blood has been noticed to come out from the wound of the vessel during extirpation.

The cases are many in which air has entered the circulation after small or medium-sized wounds of the veins, but it is to be particularly feared when the wound is large. Couty has reported a large number of cases relating especially to wounds of the internal jugular, external jugular, and anterior jugular veins, during extirpation of tumors in the neck.

He reports nine cases of introduction of air by the external jugular, five cases by the internal jugular, and two cases by the anterior jugular vein. No matter how terrible this accident may be it does not always cause death, because we have many cases on record, in which this accident has occurred during extirpation of growths in the neck, in which death did not take place. Very recently an accident of this kind occurred at Lyons during the removal of the axillary glands; the subclavian vein being opened air entered, and death was immediate.

If this unfortunate accident should occur during an operation, the first thing to do is to compress the gaping vessel with the finger; then bring the patient back to life by practising artificial respiration and all other resources employed for syncope and asphyxia. From what I have said you will

see what precautions must be taken in cases of wounds of the veins of the neck, both immediately following the accident and during the convalescence.

I now come to the consideration of traumatic and operative wounds of the cranium. The vital lesions of traumatic or spontaneous origin may also have a very serious effect on the brain and its covering, such as suppurating osteo-periostitis, caries, and necrosis, and these by being complicated with phlebitis of the canals of the diploë may transmit the inflammation to the sinuses and to the brain itself. Caries of the mastoid cells following suppurating inflammation of the mucous membrane of the middle ear, which may extend into the lateral sinus, is frequently met with, while meningo-encephalitis, pyæmia, and purulent infection are the sad consequences.

Independently of these lesions which interest the venous apparatus in an indirect way, we should study the influence of severe traumatism of the cranium, which is generally accompanied by complications for which the venous system of the cranium is immediately responsible.

Wounds of the sinus which communicate with the exterior are the most serious, and this accident (which is very infrequent) may be followed by the introduction of air into the veins; death is usually the consequence. Generally, the vessels may be hit by the vulnerating body itself, such as a ball or the blade of a cutting instrument, or by the sharp projection of a bit of bone. Pott and Hueter both report cases of perforation of the superior longitudinal sinus by a splinter of bone.

At other times the vessels may be ruptured by the shock given to the entire brain, or burst open by the tearing off of the dura mater. Hemorrhage and collection of blood are the results of these vascular lesions.

The venous blood which flows away after wounds of the cranium comes from various sources. It may be furnished by the vessels of the diploë and by the vascular prolongations which exist at the surface of the dura mater, by the different sinuses, and by the veins which surround and traverse the brain. The most important vessels and those which are the most often the seat of injury are the superior longitudinal sinus, the coronary sinus, and the cavernous and transversal sinuses. Another source of venous hemorrhage is that coming from the anterior median meningeal vein, which is frequently ruptured; its size and the fragility of its walls perhaps expose it more to traumatism than its artery. According to the form of the wounds the blood flows either inside or outside of the cranium; the hemorrhage alone may be sufficient to cause death, but this is not frequent. The only really serious hemorrhages are those due to a deep wound of an important sinus.

When the blood collects in the interior of the cranium it forms an intracranial collection. It is usually found between the dura mater and the walls of the skull. Sometimes it is found between the meninges in the cavity of the arachnoid around the pia mater. At other times it occurs

in the midst of the cerebral substance and in the ventricles. It occurs at the point struck or, on the contrary, in a point diametrically opposite, or at a distance more or less considerable from the point of traumatism. When intracranial hemorrhage occurs it produces accidents of sudden cerebral compression; this compression may cover a considerable extent of surface, which is the most favorable condition of affairs for the patient; or it may occur on a more or less limited surface of the brain, in which case the effects are far more dangerous.

In the majority of cases these collections of blood will become absorbed after a time. But you should never lose sight of the fact that later on they may be the point of an inflammatory process which ultimately results in a meningo-encephalitis. They may be invaded by an inflammation followed by suppuration, the latter resulting in pyæmia or purulent infection. This production of pus may occur very rapidly or very slowly.

I will now consider the diseases of the skin and subcutaneous cellular tissue of the head and neck in their relationship to the venous system.

Besides erysipelas, of which I have already spoken in the beginning of this lecture, boils and carbuncles are often met with on the head or neck. Although they appear to be entirely innocent, they have a very rich vascular supply from these regions, a character which is particularly serious. In fact, gentlemen, cases of death following a simple boil on the lip or on the eyelid are relatively frequent occurrences, and when an autopsy is made in subjects dying from this slight affection, the constant presence of a phlebitis has always been noticed; the inflammation invades the facial vein, and is propagated by the ophthalmic vein to the sinus of the dura mater, thus causing purulent infection and a mortal meningitis.

Carbuncle of the neck, although not so dangerous as when occurring on the face, may also become complicated by phlebitis of the veins of the vertebral column or the cranial sinuses. Broca has seen a carbuncle open directly into the vertebral canal; in another very curious case he found the occipital protuberance completely denuded, and at the autopsy he was able to demonstrate that the phlebitis extended by means of the diploë to one of the sinuses of the dura mater; the patient died with symptoms of purulent infection.

It is on account of the gravity of these affections that speedy elimination of the mortified tissues is generally recommended. This is done by incisions with the knife, thermo-cautery, or the free use of the sharp spoon.

Inflammation of the subcutaneous cellular tissue, such as abscess and diffused phlegmon that are met with on the head, may be followed by the same complications that are met with in erysipelas. Inflammation of one of the numerous plexuses which are found at the base of the cranium may also be the starting-point of a phlebitis of a sinus.

A very interesting case is reported by Labalette of a patient who, during a suppurating inflammation of the right tonsil, had an exorbitis on the same side. The day following his entrance to the hospital the left eye

was also in a state of inflammation; the general condition became rapidly worse, and death occurred on the fourth day, in the midst of symptoms of suppurating phlebitis of the ophthalmic veins and the cavernous sinuses. This diagnosis was fully confirmed by the autopsy.

The development of purulent collections in the neck near the large venous trunks often produces very dangerous accidents. Besides phlebitis, thrombus, embolus, and purulent infection, I would mention hemorrhage and ulceration with perforation. Severe hemorrhage has been known to occur after opening a suppurating gland in the neck either in children, principally at the time of convalescence from the eruptive fevers, or in adults. The blood appears a few days or even some weeks after the invasion of the purulent collection, and has evidently as a cause a change in the walls of the vessel. Out of thirty-eight cases of ulcerative abscess in this region collected by Gross, twelve involved the internal jugular vein; only one the external jugular vein. Death was the result of this complication, and occurred usually after a certain number of hemorrhages had taken place: in only three cases was death sudden in its appearance.

A case of diffused phlegmon in which the pus invaded the anterior mediastinum, producing a phlebitis of the internal jugular vein, has been reported by Trelat. Perier has observed a case of abscess of the glands of the neck terminating fatally by ulceration of the jugular vein and consecutive hemorrhage; it was a child of three years in which an abscess of the neck had very rapidly developed. An incision only through the skin made with the greatest care gave issue to pus, followed immediately by a considerable amount of venous blood; this hemorrhage was stopped by compression of the wound, but recurred during the three following days, and on the fourth it was accompanied by an attack of suffocation, and the patient died. The autopsy showed that the internal jugular vein was ulcerated to the extent of about three centimetres.

Phlebitis of the large veins is generally accompanied by cerebral symptoms due to the coagulation of blood which occurs in the sinuses. These coagulations are not always due to inflammation; they may be simply the result of the arrest of blood in the vessels on account of the compression exercised on them by purulent collections in the deep parts of the neck.

Now, gentlemen, when you find yourselves in the presence of an abscess of the neck, being aware of the dangers that may occur from lesions of the venous trunks, you should operate early; early incision is the proper conduct in the surgery of to-day. In abscess of the neck following fever Spender even advises an incision before suppuration is well established, because if the collection is opened later on there is in his opinion great danger in the operation.

We now come to the consideration of the relationship of the sinuses and the veins of the head and neck to certain neoplasms and operations. Certain vascular tumors are met with more frequently on the head and neck than in any part of the body. This relative frequency is very probably due to the

great vascular richness of the parts. You all know that *nævi*, angioma, and erectile venous tumors are found not infrequently on the face or neck. Numerous are the cases of arterio-venous aneurisms of the carotid and temporal regions; one of the forms of goitre is also characterized by the development of arteries and venous plexuses in the thyroid gland, thus producing a hypertrophy of the organ.

Arterio-venous aneurisms of the orbit are far from infrequent, and many such cases have been reported at the Ophthalmological Society of Great Britain. Two remarkable cases have been reported by Nélaton. The first case died from repeated and profuse epistaxis; the second died after ligature of the primary carotid artery. Lee reports a case of this kind; the jugular vein was very much dilated and burst, causing a severe hemorrhage and afterwards loss of sight.

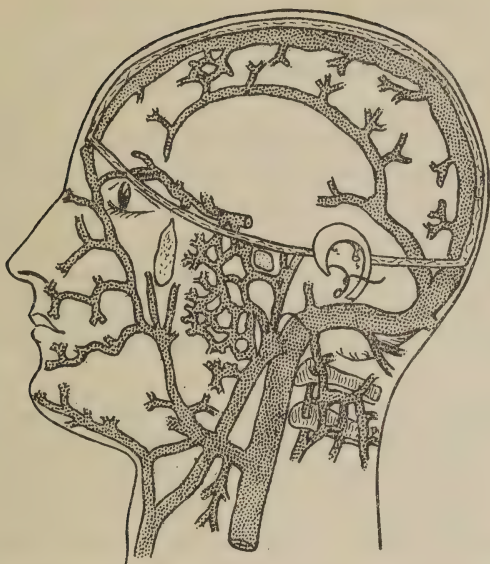
Delens in 1870 collected thirty-three cases of ligature of the primary carotid artery for pulsatile vascular tumors of the orbit, and found the mortality to be fifteen per cent. I would point out that these vascular tumors, whether arterial or venous, are far from being arterio-venous aneurisms or varicose dilatations of the ophthalmic vein and its branches in every case.

The vault of the cranium is also the seat of certain sanguineous tumors; some have no communication with the interior of the cranium, and are subcutaneous, subaponeurotic, or subpericranial; others are filled with venous blood and communicate with the intracranial circulation by means of an emissary vein of the cranium or by the diploic canals. This last variety of tumor is always connected with a traumatic or spontaneous perforation of the bone. The influence of traumatism on their development can no longer be denied since the cases of Hutin and Pott, in which there was a wound of a superior longitudinal sinus which was perforated by a splinter of bone, and thus put in communication with an extracranial tumor. Hutin found this lesion at the autopsy of his patient. Pott cured his patient by means of an operation which was performed on account of an error of diagnosis; he applied the trephine three times before he could extract the fragment which had cut through the sinus where it had remained implanted.

I have already pointed out to you the unhappy consequences which may result from a wound of a sinus or of a vein, and it is for this reason that in trephining you should always be careful not to open into a sinus, although occasionally this accident may occur when operating on a case of mastoiditis; but by quickly packing the wound and postponing the rest of the operation for a few days patients recover without further trouble.

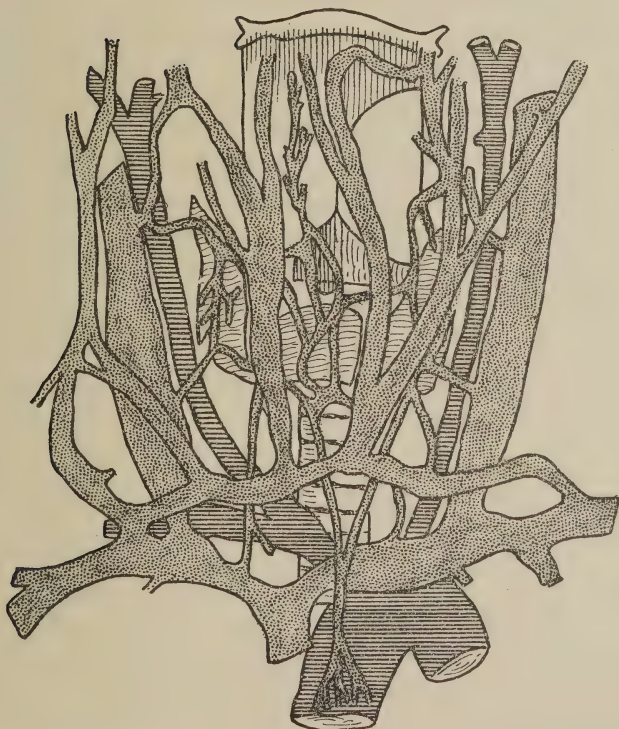
You can avoid opening the superior longitudinal sinus by trephining from fifteen to twenty millimetres from the sagittal line; the lateral sinus, being seated on the tract of the lateral glabello-iniac line, at its posterior third, may be surely avoided if you desire to reach the cerebellum by placing the trephine twelve or fifteen millimetres below this line. In order to avoid the lateral sinus in trephining the mastoid apophysis it is necessary to open the apophysis at its anterior half at the level of the meatus.

FIG. 1.



The sinuses of the dura mater, and veins of the neck and face.

FIG. 2.



Veins of the neck. (Drawings from a dissection by H. Gaudier. The veins are dotted, the aorta and its branches cross-lined.)

Incision of an abscess or phlegmon when seated in the neck should be performed as little as possible, but when this becomes necessary I would advise you to use the thermo-cautery instead of the knife, because the former is less dangerous.

In tracheotomy lesions of the inferior thyroid veins are never the cause of serious accident. One case, however, of death from this cause has been reported I believe by an English writer. The hemorrhage which results immediately after opening them is sometimes alarming, and if it does not stop as soon as the respiration of the patient begins to take place, you should resort immediately to ligation of the cut extremities. It was to avoid these accidents that Verneuil resorted to the incision of the soft part with the thermo-cautery.

The complications which sometimes occur in extirpation of tumors of the neck, such as cysts, lipomata, and fibro-sarcomata, are so grave, and tumors of the glands, particularly deep-seated tumors, are certainly all so difficult to remove, that the operation should be well planned and considered before being attempted. Very often it is well to desist from operating unless the deformity produced by the growth is very pronounced, or the patient firmly desires an operation, or especially if the tumor by its position, size, and rapid growth is the immediate cause of compression of the deep organs of the neck.

And, lastly, let me say that in order to be prepared for the dangerous complications of hemorrhage and entrance of air into the veins, you should always take the greatest precaution during the operation; go slowly, and ligate your veins successively between two ligatures, and afterwards cut them when both ends are strongly sealed together by your silk. By operating in this manner you will avoid denuding the large veins which can give rise to an extensive and progressive thrombosis.

I have now done with the subject of to-day's lecture, and in closing I would request that you carefully examine the two accompanying drawings of the veins of the neck and head, which will render my lecture more clear to you.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

Pyocyanic Disease in Human Pathology. (*Comptes Rendus de la Société de Biologie*, July 17, 1896.) By M. Charrin, M.D.

An extraordinary case has been observed by Dr. Bardon, in which a issue woman of forty-five years could voluntarily cause a greenish liquid to from her breasts. The patient was neurotic, and had suffered for many years from dyspepsia, but had never had fever or other symptoms of acute disease. Certain areas of peculiar pigmentation upon the skin suggested a generalization of the pigmentary process. Cultures finally determined the presence of the bacillus pyocyaneus in the liquid from the breasts.

A Symptom of Fæcal Tumors. (*Wiener klinische Wochenschrift*, October 1, 1896.) By R. Gersuny, M.D.

The symptom consists of a peculiar sensation of sticky separation that is imparted to the finger when it is pressed firmly into the tumor and then slowly relaxed. The conditions essential to the production of this symptom are a certain degree of dryness of the intestinal mucous membrane, and a certain amount of impressionability on the part of the mass of fæces; thus, if the latter be too hard, it may not be possible to elicit the symptom until an oil clysma has been administered. Finally, there must be enough gas in the intestine to force the wall away from the surface of the tumor as the pressure is generally relaxed. The symptom indicates, therefore, that a somewhat doughy mass, together with gas, is enclosed in a smooth-walled sac. Gersuny names it the "Klebe symptom," which may be freely translated as the "adhesion symptom." To test its presence, the finger is placed over a prominent portion of the tumor, and pressed slowly and deeply into it; then the pressure is gradually diminished, and the finger very slowly raised, when the separation, as of two sticky surfaces, is very easily distinguished.

The case that led to the discovery of this symptom is sufficiently inter-

esting to deserve a brief note. The woman had suffered from obstinate constipation from infancy; at various deliveries a firm pelvic tumor had been noticed that interfered with parturition. A diagnosis was made of neoplasm of the adnexa, and operation advised. When the abdomen was opened, the Sigma Romanum and descending colon were found to be greatly distended, and in the lower part of the former there was an enormous mass of fæces. The wound was therefore closed. From this time Gersuny's symptom was very evident upon every attempt at palpation until, after oil clysmata with massage, the tumor was finally expelled. Two other cases were also observed, in both of which Gersuny's symptom and hypertrophy of the colon were present, and the interesting question is raised as to whether the coprostasis or the hypertrophy of the colon is the primary affection. All treatment excepting injections of oil with massage has so far been useless.

A Case of Ulcerative Endocarditis treated with Antistreptococci-serum; Recovery. (*Lancet*, October 17, 1897.) By Dr. Sainsbury.

The patient was a lad of thirteen years, who had been sick for more than two weeks, complaining of pain in the chest, and suffering from delirium and some fever. Upon admission the area of cardiac dulness was found to be enlarged, and there were a thrill and double murmur at the apex. The breath-sounds were weak and there was crepitation in both lungs. Four days after admission a symmetrical erythematous rash appeared on the buttock and spread to the rest of the body; and five days later streptococci were found in the blood. The symptoms now grew irregularly worse, until the patient had relapsed into a state of extreme cachexia. In this condition, more than two months after the onset, treatment with antistreptococci-serum was commenced. The first dose was of twenty cubic centimetres, and within a week forty cubic centimetres more had been given. There was no reaction, but the condition of the patient improved very rapidly until he was able to sit up, although the temperature curve was not absolutely normal. Six days after the previous series of injections, therefore, a final injection of ten cubic centimetres was made. This was followed by a rise of temperature to 102° F., malaise, and considerable pain at the site of the injection. After this the temperature remained normal, all the physical signs disappeared, and the patient was discharged cured.

A Case of Lobar Pneumonia with a Hyperpyrexial Temperature of 109° F.; Recovery. (*British Medical Journal*, October 24, 1896.) By J. Kymaston Couch, M.R.C.S.

The excessive temperature occurred upon the evening of the second day, before any of the physical signs of pneumonia had developed. There was some delirium, but no other symptoms of cerebral disturbance. On the third day tubular breathing and other signs of pulmonic infiltration

were distinct, and crisis occurred upon the sixth day. Every effort appears to have been made to insure the accuracy of the record, which was taken in the axilla of the three-year old patient.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

A Discussion on Sporadic Cretinism and its Treatment. (*British Medical Journal*, September 12, 1896.)

At the Sixty-fourth Annual Meeting of the British Medical Association the treatment of sporadic cretinism was under discussion.

W. Rushton Parker, M.A., M.D., found the following changes after treatment with thyroid extract :

1. A great and rapid diminution of bulk, due to absorption of myxœdematous deposits, seen especially in the collapse of the protruding abdomen ; in the spontaneous reduction of umbilical herniæ ; in the recession of the previously swollen tongue behind the teeth ; in the disappearance of baggy swellings under the chin, above the collar-bones, outside the nipples, and elsewhere ; in the thinning of the lips ; and in the disappearance of the dropsy-like puffiness of the face, limbs, and other parts of the body.

2. A great and rapid increase in physical development, shown especially by a rapid growth of several inches in height, even in cretins of from twenty to thirty years of age, whose stature had been nearly or quite stationary for many years previously ; also by the replacement of the coarse, sparse hair by a more abundant and finer growth ; by the eruption in quick succession of teeth which had been long overdue, as in cases where the milk-teeth still persisted at twenty years of age ; and by a substantial increase of body weight, after the initial loss from absorption of myxœdematous deposits.

3. A striking diminution of several hideous deformities, especially of the lordosis in the lumbar spine, of the bulky head, of the ugly sinking of the bridge of the nose, and sometimes of the rickety curvatures of the legs. Many cases, however, show little or no improvement in the deformity of the legs, owing to the softening of bones produced by the thyroid extract and to the fact that the majority of cretins are allowed an undue use of their legs during treatment.

4. A rapid and very striking increase of intelligence occurred, as was well seen by comparing the dull, stupid, heavy, listless, often idiotic counte-

nance before treatment with the bright, cheerful, pleasing expression which soon took its place.

Telford Smith, M.D., found that in treating cretinism by thyroid gland the growth of the skeleton became so rapid that some softening of the bones took place, so that the leg bones were liable to become bent if the child was allowed to go about. When bowing of the legs was observed he placed the patient in bed.

John Thompson, M.D., F.R.C.P. (Edin.), had treated five cases of cretinism with thyroid extract. The rate of growth of the patient and the amount of increase in height was in inverse ratio to the age of the patient and to the stage of treatment. In the child, the degree of growth of the different parts of the body seemed in all respects normal. In adult patients the hands and feet changed very little in character, while in adolescents they grew long and became more natural in shape. In young cretins the legs grew faster than the arms; in adolescent cretins the growth of the upper and lower limbs was very nearly the same, while in adult cretins the arms grew more than the legs. Increase of spinal curvature and bowing of the legs were noted as complications of this growth. In the child and the adolescent cretins the characteristic coarse hair was rapidly replaced by hair of a softer and finer quality and of a somewhat duller shade. In adult cretins there was practically no change in the hair after more than two years treatment. Children, adolescents, and the aged seem to improve mentally after about six months of treatment. From being dull, morose, and self-centred these patients become in a varying degree bright, happy, and sociable.

Victor Horsley, F.R.C.S., F.R.S., stated that cretins whose bones showed signs of softening should be kept lying down as they would be in ordinary rickets. Grafting thyroid into the peritoneal cavity was only a temporary measure equivalent to injection of thyroid material, in no way constituting a real transplantation of the gland, which should be effected by embedding the organ in connective tissue.

Dr. J. Finlayson said that grafting was useless with a hope of securing permanent benefit.

On the Bromide of Strontium in Epilepsy. (*Lancet*, September 26, 1896.) By Anthony Roche, M.R.C.P. (Irel.), of Dublin.

The author has found that bromide of strontium can sometimes be borne when the other bromides produce deleterious results. It seems to add to the efficiency of the other bromides when administered together with them.

Carbon Bisulphide Poisoning. (*Berliner klinische Wochenschrift*, July 13, 1896.) By Dr. Stadelmann.

The symptoms of this condition are variable, and consist of digestive disturbances, muscular weakness, tremor, ataxia, increased muscular irrita-

bility, painful muscular spasm, disturbed sensation, sometimes increased and sometimes diminished knee-jerks. There were three cases observed within a short period of time, all of which came from a rubber factory in which the hygienic conditions were not satisfactory. In the discussion Bernhardt said that the poison might affect the peripheral nerves and give rise to a degenerative neuritis and paralysis. The French writers claim that the condition may give rise to hysterical manifestations. But Stadelmann differs from them in this respect. Kronig had seen one fatal case in a patient the subject of Bright's disease. Kahlischer thought that the disease presented the characteristic features of a toxic affection of the nervous system such as is found in poisoning by lead, alcohol, etc. Stadelmann said that he found no changes in the optic disc.—*British Medical Journal*, September 19, 1896.

Antituberculous Serum and its Antitoxin. (*Presse Médicale*, June 10, 1896.) By C. Maragliano, M.D.

In this paper M. Maragliano describes the method employed for the preparation of antituberculous serum and publishes his researches upon the antitoxin which this liquid contains. In order to obtain it animals are inoculated with toxic substances derived from virulent cultures of human tuberculosis. These toxic materials are prepared in two distinct groups: First, a liquid, A, is procured by evaporating the culture at one hundred degrees on a water-bath and filtering it through a Chamberland filter, as is done in the preparation of tuberculin. Second, a liquid, B, is obtained by passing the unwarmed culture through the Chamberland filter and concentrating it in a vacuum at thirty degrees.

Animals which can furnish serum (horses) are inoculated with a mixture of three parts of the liquid A and one part of the liquid B. In the beginning two milligrammes of the mixture are injected for each kilogramme of weight of the animal. This dose is increased one milligramme a day and per kilogramme until forty to fifty milligrammes for each kilogramme are given. After this the same quantity is inoculated for six months. At the end of this time the animal is immunized, because then it resists the inoculation of considerable quantities of toxic materials and the injection of cultures virulent enough to kill the control animal. Three or four weeks after the cessation of the injections there will be considerable toxic material in the blood. The animal is then bled and the antituberculous serum is thus obtained.

This serum contains specific antitoxins which neutralize the action of the tuberculous poisons. Experiments upon healthy guinea-pigs and upon tuberculous guinea-pigs demonstrate the fact. Even upon man affected with tuberculosis this action can be shown, a fact which Professor Reugi has confirmed at the clinic in Naples. This serum possesses a bactericidal property in the test-tube in company with the bacillus tuberculosis. And, what is more, the power of the antitoxic serum can be graduated.—(*Annales de la Polyclinique de Paris*, September, 1896.)

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D., AND
New York City,

WM. G. SPILLER, M.D.,
Philadelphia.

The Degeneration of the Pyramidal Tracts after Unilateral Extirpation of the Centres for the Extremities. (*Neurologisches Centralblatt*, Nos. 11 and 12, 1896.) By Max Rothmann, M.D.

The first part of this paper is devoted to a review of the literature on degeneration of the pyramidal tracts after a unilateral cerebral lesion. In the second part are stated the results of the author's experiments on dogs and monkeys for the purpose of determining the frequency of involvement of the pyramidal tract in the oblongata and cord on the side of the cerebral lesion.

He draws the following conclusions :

1. Bilateral degeneration of the crossed pyramidal tract occurs after unilateral extirpation of the centres for the extremities.

2. This degeneration may be found in all recent cases as late as four weeks after the operation, although the involvement of the pyramidal tract on the side of the lesion is often slight.

3. The degeneration of the crossed pyramidal tract on the side of the lesion begins in the motor decussation. The fibres which come from the normal pyramid are injured by the pressure exerted by the fibres from the affected pyramid. This is because in the early stages of degeneration there is a swelling of the fibres.

4. In the course of two to four months after the operation the degeneration of the crossed pyramidal tract on the side of the lesion begins to disappear and later cannot be observed.

5. The persistence of this degeneration in man to later periods is largely due to impaired nutrition of the central nervous system from vascular disease.

6. In some of the recent cases a few degenerated fibres are observed, which pass from the affected pyramid through the interolivary layer to the opposite olive. The significance of these fibres is not known.

7. There is no decussation of pyramidal fibres within the cord from one lateral pyramidal tract to the other.

Rare Forms of Hereditary and Family Cerebral and Spinal Diseases. (*Deutsche Zeitschrift für Nervenheilkunde*, vol. ix., Nos. 1 and 2.) By Heinrich Higier, M.D.

Higier describes a new form of progressive family disease observed in four sisters. The symptom-complex in all the cases was nearly the same.

Hereditary influence could not be demonstrated. The disease began in

the seventh to the twelfth year, and did not immediately follow any infectious process. The first symptom was a feeling of weakness and stiffness in the legs, which gradually increased and resulted in spastic paraplegia and contracture of the limbs.

Three to four years after the beginning of the process the upper extremities began to grow weak, and the movements here became awkward. In the elder sister the muscles of the upper and lower limbs were atrophied. The tendon reflexes in the upper extremities were in part normal, in part exaggerated; in the lower limbs they were intensified. Dysphagia was observed in most of the cases, bradylalia and nasal speech in two, strabismus in one, subluxation of the lower jaw and nystagmus-like movements of the eyeballs in one case. In all the sisters primary atrophy of the optic nerve, limitation of the visual fields, and partial achromatopsia were found, and in one temporary ataxia was noted. Mental weakness was present. No cause for the disease could be detected.

This type corresponds strictly to none of the known forms of disease, although perhaps more to cerebral diplegia than to any other. Higier, in this long and interesting paper, reviews the literature on the subject, and mentions particularly the presence of ataxia in certain forms of cerebral diplegia.

The Course of the Posterior Roots in Man. (*Neurologisches Centralblatt*, No. 8, 1896.) By Alexander Marguliés, M.D.

Dr. Marguliés examined the cord from a case of general paresis by the method of Marchi. At the level of the sixth thoracic roots a degenerated area was observed in the right column of Burdach, which extended to about the anterior third of this column, occupied about two-thirds of its width, and was close to the posterior horn. In other words, the cornuradicular zone of Marie was degenerated. At the level of the first thoracic roots the degenerated fibres were found pressed inward and separated by a small zone of normal tissue from the septum paramedium dorsale. At this part the degeneration had the form of the letter L, one limb of which scarcely reached the anterior third of the column of Burdach, while the other was near the periphery. At the level of the third cervical roots the degenerated area had diminished in size and was still located on the inner side of the column of Burdach.

It is evident from this that the fibres from the sixth thoracic roots do not enter the columns of Goll. The degeneration may be regarded as *tabes insipiens* or as the result of *cachexia*.

Traumatic Ulnar Neuritis, Deviation of the Fingers "en Coup de Vent," Retraction of the Palmar Fascia. (*Revue Neurologique*, No. 18, 1896.) By E. Feindel, M.D.

As a result of injury of the right ulnar nerve the fingers of the right hand were found greatly deviated towards the ulnar side "*en coup de vent*."

The palmar fascia was contracted. The author has not been able to find a similar case recorded. Muscular atrophy, changes in sensation, and glossy skin were observed in the hand.

The peculiar position is explained as the result of trophic changes of the ligaments, of the fibrous tissues of the hand, and of the articular ends of the bones, and as the result of contraction of the palmar fascia. The deformity was similar to that produced by chronic articular rheumatism, and the author emphasizes this fact especially.

Hemiatrophy of the Face from Central Disease. (Verein für Psychiatrie und Neurologie in Wien, *Wiener klinische Wochenschrift*, No. 20, 1896.) By H. Schlesinger, M.D.

A young man, of twenty-three years, complained of pain on the right side of the neck, dysphagia, and imperfect vision in the right eye. Syphilitic infection was denied. After a time dysarthria and paralysis with atrophy and fibrillary contractions of the right side of the tongue developed. Still later complete paralysis of the right vocal cord, wasting of the right side of the face, narrowing of the right palpebral fissure, increased disturbance of sight, uncertain gait, vertigo, and a feeling of anxiety were noted. The patient did not suffer from vertigo or headache when in the reclining position. There was no history of alcoholic excess. The atrophy of the right side of the face was very evident and involved the bones of the head.

Nystagmus-like movements, slight paresis of the right external rectus, lessened sensation for pain, and absence of reflexes from the mucous membranes on the right side, diminution of the reflex from the palate and pharynx on the left side, paresis of the right masseter, paresis in the distribution of the upper branch of both seventh nerves, and complete paralysis in that of the lower branch, with diminution of the electrical excitability, are reported. The senses of taste and smell were absent on the right side. A tumor could be felt on the right side of the pharynx. The cause of all these symptoms was supposed to be a basal affection and may have had some connection with this tumor.

Electrical Irritation of the First Thoracic Root in Man. (*Berliner klinische Wochenschrift*, No. 34, 1896.) By Professor H. Oppenheim.

Madame Dejerine-Klumpke has demonstrated that the oculo-pupillary fibres in the dog leave the spinal cord by means of the first thoracic roots. Numerous cases since the publication of her experiments have shown that these fibres in man have the same course, but it is not positively known whether the eighth cervical and second thoracic roots also contain some of these fibres. Dr. Oppenheim, after opening the dura of a man, applied the electrode to the second thoracic root without any result, but as soon as the first thoracic root was irritated the pupil on the same side was dilated *ad maximum*. The dilatation lasted a few seconds. As the eyelids had to

be held open, he was not able to observe enlargement of the palpebral fissure.

The Antitoxic Action of Hyposulphite of Sodium against Cyanide of Potassium and Malonitrite. (*Bulletin de l'Académie de Médecine de Belgique*, vol. x., No. 7, 1896.) By MM. Heymans and Paul Masoin.

Malonitrite or "malonique nitrite" has the formula $\text{CNCH}_2\text{—CN}$. This substance produces a characteristic train of symptoms when given to rabbits and other animals. Hyposulphite of sodium possesses a preventive antitoxic action against malonitrite, as it does against the cyanide of potassium, but this action is more marked. The action of the sodium salt upon the cyanide of potassium was proved by Lang. If the hyposulphite is given before or immediately after the poison, it prevents the symptoms of intoxication. And, furthermore, the hyposulphite possesses a curative action when the intoxication of malonitrite is well established. On the other hand, if the symptoms of poisoning by cyanide of potassium exist at their height, it is impossible to save the animal. When the symptoms of poisoning by malonitrite are well marked, the recovery after the administration of sodium hyposulphite will be observed in two or three minutes if the remedy is exhibited by the intravascular route, in from five to ten minutes if it is given hypodermically, and in from ten to fifteen minutes if given by the mouth.

After the intravenous injection of a quantity of cyanide of potassium less than the fatal dose, it is impossible to shorten the duration of the toxic symptoms, unless the hyposulphite is injected as soon as these symptoms have reached their height. But in poisoning by malonitrite the administration of the antidote will shorten the duration of the intoxication. Antitoxic serums and hyposulphite of sodium when used as antidotes to cyanide of potassium are "preventive blood antidotes," capable of neutralizing poison after absorption. Hyposulphite of sodium holds the position of a "curative cellular antidote" to malonitrite; it is capable of decomposing the combination of the poison with the living substance. This single example seems to justify the prediction that analogous antidotes will be discovered for other chemical poisons and for toxic substances of bacterial origin.

Antipyrin as a Local Analgesic. (*Archives cliniques de Bordeaux*, August, 1896.) By Louis Mencièrè, M.D.

The author suggests the use of antipyrin as a local anæsthetic in operations on the male tunica vaginalis, in acute tonsillitis, and in the removal of small tumors from the skin. In hydrocele of the tunica vaginalis, after the fluid has been removed, a ten-per-cent. solution of antipyrin in water is injected and allowed to remain in contact with the serous membrane five minutes before the tincture of iodine is applied. This method entirely dispenses with the pain of the latter application.

In cases of acute tonsillitis a gargle, composed of ten grammes of antipyrin, ten grammes of chlorate of potassium, one hundred grammes of peppermint water, and two hundred grammes of distilled water, is used whenever the painful crises occur.

Subcutaneous injections of from ninety centigrammes (thirteen and a half grains) to one gramme (fifteen grains) of antipyrin were used by the author to lessen the pain of the removal of a pigmented epithelioma from a man, aged sixty years. The injections are free from the dangers of cocaine; but they do not replace that drug as a local anæsthetic.

Antipyrin used in this manner is not a complete pain-destroyer; its analgesic power does not correspond at all with the results obtained when used as a gargle or when injected into the sac of a hydrocele.

Partial Epilepsy in Acromegaly. (*Medical Record*, September 26, 1896.)—Drs. Raymond and Souques have reported a case of acromegaly of many years' standing in a man aged fifty-four, who in the last three years had developed Jacksonian epilepsy limited to the right upper extremity and right side of the face. They stated that the hypertrophy of the pituitary gland, in their opinion, constituted a cerebral tumor capable of exciting from a distance the cortical psychomotor centres.

Cord Lesions produced by Microbic Toxins. (*Medical Record*, September 26, 1896.)—At the French Congress of Alienists and Neurologists, held at Nancy in August, 1896, Dr. H. Claude, of Paris, reported his studies of cord lesions produced by microbial intoxication of four cases, as follows: 1, a guinea-pig, poisoned gradually by the toxins of the colon bacteria, became paralyzed in one foot, then in two feet; 2, a dog poisoned by the toxins of diphtheria, in the course of a month, paresis of the hind feet; 3, a dog poisoned by the toxins of tetanus (two months), developed posterior monoplegia, then paraplegia, and finally paresis of all the limbs; 4, a rabbit, poisoned by pyocyanic toxin, died without paralysis. Besides gross lesions of the vessels, Claude found centres of softening and infiltration of leucocytes; also cell alterations, varying with the degree and intensity of the intoxication and the part of the cord acted upon by the toxins. In the cases of slow intoxication there were all degrees of cell-changes in the cord, and, alongside elements still intact, there were others entirely degenerated.

Intradural Section of the Spinal Nerves for Neuralgia. (*Boston Medical and Surgical Journal*, October 1, 1896.) By Robert Abbe, M.D.

This new procedure for the relief of intractable cases of neuralgia involves a laminectomy of a number of vertebræ, the exposure of the dura, the verification of the spinal roots by a battery, and excision of the sensory roots. Dr. Abbe has operated on three cases as follows: (1) Male, aged forty-four; for nearly two years ascending neuritis, pain in the right arm,

following violent work. He had many operations, including amputation at the shoulder. Acquired morphine habit. Both roots of the sixth and seventh cervical were divided outside the dura, but inside the spinal canal. No evidence of permanent relief after eight years. (2) Male, aged forty-five; exposure to cold; ascending neuritis in left arm; many operations on the nerves—resection and stretching—with no relief during two and a half years; agonizing pain, paroxysmal and constant; morphine habit. The posterior roots were divided intradurally,—sixth, seventh, eighth cervical, and first dorsal. Immediate relief from pain with some return in the second week. Six years later an inmate of an invalid home. Relatively slight evidences of pain. (3) Male, aged forty; incessant athetoid movements of the arm with intense neuralgia of the forearm; amputation below the shoulder attended with no benefit; bulbous nerve-ends dissected out. The posterior roots were divided from the fifth cervical to the first dorsal, and three ounces of the spinal fluid escaped; the anterior roots of the sixth, seventh, and eighth cervical, and first dorsal were also cut. Eighteen months later there was none of the former athetoid movement nor the objective evidence of suffering such as had formerly been present, though the patient stated that he still had some pain. References to four other cases, by Bennett, Horsley, and McCosh, are rather encouraging to the further trial of this operation.

Report of Thirteen Cases of Multiple Neuritis occurring among Insane Patients. (*Medical News*, October 3, 1896.) By E. D. Bondurant, M.D.

These cases occurred between November, 1895, and February, 1896, in a hospital holding twelve hundred patients, at Tuskaloosa, Alabama, two hundred miles north of the Gulf of Mexico. Four cases were in white men and eight were in white women. One was in a colored woman. The neuritis affected the lower extremities in all the cases, and the lower extremities alone in ten of the cases. The other three cases, in which the nerves of the arms and body became involved, all proved fatal, although only one of these fatal results could be attributed directly to the neuritis. In one case the neuritis followed in course of a miliary tuberculosis, in one it followed a bilious attack, in one, the Flechsig treatment for epilepsy. In one case there was a doubtful malarial infection; in the other cases there was no assignable cause. The patients were young or middle-aged, and had been in the institution some time; four were epileptic; all were demented more or less; none had used alcohol, and in only one case was a (doubtful) history of syphilis obtained.

In most of the cases there were evidences of an acute general toxæmia, usually noted for a day or two before the local symptoms attracted attention; in three cases no symptoms of general disease were noted. The blood of several of the patients was examined for the plasmodium of malaria without success. There were sometimes distinct chills at the onset, a rise

of temperature, anorexia, dryness of the mouth and throat, furred tongue, and pain in the legs increasing in severity. Muscular weakness and inco-ordination were then noticed, and sensory disorders, diffuse or irregularly distributed areas of hyperæsthesia or (rarer) anæsthesia; tenderness on pressure was common. The tendon reflexes were abolished in all cases. The autopsies were without result as far as the neuritis was concerned.

The Traumatic Neuroses in their Medico-Legal Relations. (*Medical Record*, September 26, 1896.) By A. L. Hall, M.D.

The author's conclusions are:

1. The surgeon should be an equal authority with the neurologist in determining the sequences of trauma upon the nervous system.
2. Neurasthenia is the usual form under which traumatic neurosis expresses itself, and its symptoms are indistinguishable from neurasthenia arising from other than traumatic influences.
3. The actual condition of the patient previous to the accident must be known in order to reach a correct estimate of the damage from injury sustained by the nervous system.
4. The type of symptoms manifested by the neurosis, whether neurasthenical or hysterical, is oftentimes a question of vital importance in the adjudication of a claim for damages.
5. Traumatic neurosis occurs oftenest at the centres of population, but it is by no means a rare affection in the country districts.
6. It is probable that traumatic neurosis is dependent upon some definite—yet unknown—change in the arrangement and structure of the cellular elements of the nervous system, which gives rise to stable rather than unstable symptoms.
7. A stable, well-organized symptom complex indicates damage to the nervous structures; while instability of symptoms and want of orderly arrangement denote trivial injury,—and, if long continued, simulation is rendered probable.
8. The so-called “objective symptoms” depend upon the psychical rather than the physical state of the subject, and are unreliable guides to diagnosis.
9. A correct diagnosis is best obtained from a reliable account of the accident, the history of the previous state of the patient, the presence of surgical troubles, and the existence of a stable, well-defined, organized symptom complex.
10. The term “traumatic neurosis” is an expression for an indefinite condition, and a simplification of the subject is desirable from a clinical stand-point.

Epilepsy: Treatment by Pituitary Extract. (*Archives de Physiologie*, 1896, No. 3.)

MM. Mairel and Bosc have reported their experiments with pituitary

extract of animals, in the case of healthy individuals and in the case of twenty-one epileptics; of the latter six were men and fifteen were women.

The remedy produced a slight elevation of temperature, a somewhat greater rise in the pulse. The agent was used by the mouth and hypodermically in the dose of one to four pituitary glands of the ox daily. The attacks of epilepsy were not diminished in number. The use of the extract was followed in some cases by mental excitability approaching delirium.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children,

AND

LAWRENCE S. SMITH, A.B., M.D.,

Instructor in Clinical Gynæcology in the University of Pennsylvania.

Experiences with Laborde's Rhythmical Traction on the Tongue, with Remarks on the Injuries caused by this and other Methods of Resuscitation. (*Centralblatt für Gynäkologie*, 1896, No 28.) By Ludwig Knapp, M.D.

Laborde announced his new method of resuscitating the apparently asphyxiated to the Paris Academy of Medicine in July, 1892. It consists of merely drawing forward the tongue rhythmically until the first spontaneous inspiration takes place. It causes a reflex irritation of the respiratory centre through the nerves of the tongue and throat. Knapp reports briefly eleven cases on whom this method was tried successfully,—in ten it was tried as a last resort after other methods had failed. He concludes:

1. Even in desperate cases one should not despair of saving the infant's life.
2. Laborde's method should be used exclusively in a larger number of cases before forming a final judgment in regard to its work.
3. Should its claims be substantiated, it must be looked upon as a valuable addition to our methods of resuscitating apparently asphyxiated infants in that it is especially adapted to those cases which are not suited for Schultze's method,—namely, premature infants.
4. On account of its simplicity, Laborde's method is free from objection. It is grounded upon the physiological connection between certain glossopharyngeal nerves and the medulla.
5. An advantage, not to be underrated, lies in the fact that the method can be practised on the infant while in the warm bath, obviating the dangerous cooling of the body necessitated by the other methods.

6. The method is unusually simple and easy to learn. It has the advantage—important in private practice—that its employment does not make the disagreeable impression upon the by-standers or upon the newly-delivered mother that the others do.

Knapp then gives the history and the post-mortem findings in a case in which all efforts at resuscitation failed. After working over the child for two hours and a quarter shallow respiration was established, but death followed eight hours later.

Clinical Results of Nearly Five Hundred Vaginal Hysterectomies. (Jacobs.)—In No. 29 of the *Centralblatt für Gynäkologie* for 1896 is a report of the last meeting of the Belgian Gynæcological and Obstetrical Association, at which Jacobs read a paper in which he reported a series of four hundred and ninety-nine vaginal hysterectomies, with a mortality of seventeen, or only a little over three and four-tenths per cent.

The indications for the hysterectomies were as follows :

	Cases.	Deaths.
Carcinoma.....	49	...
Adenoma.....	14	...
Fibroma.....	42	3
Ectopic pregnancy.....	3	1
Hydrosalpinx and pyosalpinx.....	37	2
Double pyosalpinx.....	176	7
Chronic inflammation of appendages.....	136	3
Complete prolapse.....	24	1
Secondary hysterectomy after laparotomy.....	17	...
Total.....	498	17

He prefers the thermo-cautery to either knife or scissors in the first steps of the operation, as it causes less hemorrhage and insures better drainage. He uses clamps on the broad ligaments, two or three on each side, and then replaces them with silk ligatures, finally closing the vaginal wound by a silk suture passed through both peritoneum and vaginal wall. In septic cases, where drainage is required, he uses gauze moistened with sterilized glycerin.

Changes in the Uterine Mucosa after Castration. (*Centralblatt für Gynäkologie*, 1896, No. 30.) Dr. Eckardt.—As a result of the microscopical examination of a uterus removed from a patient on whom a double salpingo-oöphorectomy had been performed two years previous, Eckhardt concludes that “the mucous membrane of a uterus in which atrophy has been caused by castration undergoes the same retrograde changes that accompany senile atrophy,—namely, the cilia of the epithelium are lost, the epithelium and the interglandular stroma atrophy, and the glands become less numerous and tend to become cystic.”

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

A CASE OF CONTRIBUTORY NEGLIGENCE DEFEATING AN ACTION FOR ALLEGED MALPRACTICE.

AN action¹ for damages for alleged malpractice was brought by a free patient at the H. Hospital against one of the surgical staff of that hospital, who happened to be on duty at the time the plaintiff was in the hospital. The plaintiff, R., a carpenter, was injured on December 5, 1890, by falling from a scaffolding on which he was working, and shortly afterwards was conveyed to the H. Hospital, where he remained until December 18, when he left the hospital, going to the town of W., where he remained until the 23d, when he went to B., arriving there on the night of the 23d.

The next morning a physician was called, who declared that the plaintiff had a complete oblique fracture of both bones of the left leg an inch or so above the ankle. There was no allegation of negligence until a short time before suit was brought, on April 22, 1892. The case was tried three times: the first trial resulted in a verdict of \$5512.50 for the plaintiff, which the court set aside; the jury disagreed on the second trial; the plaintiff obtained a verdict of \$12,000 on the third trial, although in his statement damages were laid at \$10,000. The court refused to order a new trial, but required the plaintiff to abate all in excess of \$4000, which he did, and from this the defendant appealed.

In his statement of claim the plaintiff alleged that he had sustained a fracture of both bones of the leg a short distance above the ankle-joint, and was treated not for a fracture, but for a sprain, and was thereby greatly injured. It was not claimed that the treatment was improper for a sprain, but that it was entirely incorrect and inadequate for a fracture. The defendant denied most positively that there was a fracture, and his testimony is supported by that of two other surgeons who saw and examined the plaintiff's leg on the day and immediately after the injury was sustained, and also a number of surgeons who examined it at subsequent times, and testified that, in their opinion, there never was a fracture. The great controversy in the case turned upon two points: first, whether there ever was a fracture, and, second, whether the subsequent condition of suf-

¹ Richards *vs.* Dash, 176 P. S. 181 (1896).

fering and illness of the plaintiff was produced in whole or in part by acts of contributory negligence on his part. If there was no fracture, or if the plaintiff's negligence contributed to the injury, in either event, he had no case, and on both these points the trial court so instructed the jury.

On behalf of the plaintiff, one surgical witness, Dr. E., testified that he first saw him on December 23, 1890, or eighteen days after the accident, at his office in B., and that he readily and in a very few minutes found a complete fracture of both bones. In the fracture of the tibia the lower portion of the bone projected up over the upper portion about half an inch, and made a distinct ridge, easily perceived by the eye and, of course, by the touch. Dr. C., a surgical witness who was called in on January 23, 1891, testified that he inserted his finger in a hole in the leg which had been produced by suppuration and found the ends of broken bones overriding each other, and testified that there was a fracture of the tibia. He knew nothing about the fibula. Two other surgeons, neither of whom had seen the leg until long after the accident, testified as to general matters relating to fractures and their treatment. Their testimony and that of Drs. E. and C. constituted the whole of the plaintiff's surgical testimony.

All the surgical testimony in the case, both for the plaintiff and defendant, establishes the fact that fractures of the tibia are most easily discoverable, the reason being that the tibia has very slight covering over it in the way of muscles, tissue, or flesh.

The testimony of the defendant, denying the existence of a fracture, was equally positive, ten surgeons, several of them of great eminence and wide experience, so testifying. Dr. M., the first surgeon called to see the patient after the accident, testified that he made a careful examination of the leg in the usual manner by inspection and manipulation, and found the patient was badly bruised, but that no bones were broken, and it was in accordance with his advice that the patient was sent to the hospital. The same surgeon was examined at the second trial, in June, 1893, and repeated that there was no fracture when he first examined the leg of the patient; and, being asked a long question which described the fracture as testified to by Drs. E. and C., said that there was no evidence of the fracture when he saw him first, and he found no evidence of fracture when he saw him last.

Dr. N., the resident surgeon at the hospital, next saw the patient after the accident. He went with the ambulance and assisted in removing the patient to the hospital, first making an examination at the place where they found him. After he reached the hospital the patient was undressed and put to bed, and he then proceeded to make a full and thorough examination of the leg by all the usual and well-known methods practised by surgeons in such cases. He compared the two legs for shortness, manipulated the limb with his hands, following the bones as far as he could; he then examined for crepitus, and then tried it for mobility by taking hold of it by the heel and twisting it, holding the leg fixed. He was unable to find any

evidence of fracture, and diagnosed the case as one of sprain and concussion, and treated it accordingly with hot compresses and hamamelis extract, to allay pain and reduce swelling and inflammation. About four o'clock the same afternoon Dr. D., the defendant, employed all the usual methods of examination without discovering any fracture. The following day he made another examination, which is thus described by him: "The next examination was made, I think, a day or so afterwards, and then the examination was more thorough. I would take the leg in both hands, one hand at the heel and the other at the ankle-joint, and made the ordinary manipulations. Q. Now, what were those? A. Well, it was from one side to the other, up and down. Those were the ordinary manipulations, in the first place, to find out if there was any crepitation, and, in the second place, by putting it side by side we would see if there was a fracture; the portion of the bone, perhaps, could be felt by the finger. These are the manipulations: Taking this portion of the heel in my hands and working it backward and forward in that manner and then working it up and down so" (explaining to the jury). He had previously stated in the other part of his examination thus: "I then examined him by running my hands over the spine of the tibia, down the course of the fibula; didn't make much motion; compared one leg with the other to see if there was any shortening; there was no apparent shortening at all." He made several of the examinations while the patient was in the hospital; four or five in all. He was asked, "Q. Well, doctor, what conclusion did you arrive at as regards this case? A. That there was no fracture."

Commenting on this portion of the defendant's evidence, the Supreme Court said, "Now there was not a particle of testimony in the case that this was not the usual, correct, proper, and sufficient method of examination in ordinary use by all surgeons, and, so far as this subject is concerned, there was no testimony to the effect that this was incorrect practice in any degree. Three skilled, competent, and careful surgeons, in full practice, testified, after having seen and carefully examined the plaintiff immediately after the accident and on succeeding days, that there was no fracture of the leg. The treatment given him was the proper and usual treatment if there was no fracture, and there was nothing in the testimony upon which a right of recovery could be based, except that there was a fracture, in fact, which was not discovered by any one of these three surgeons, but was discovered by two other surgeons, the first of whom saw the patient eighteen days after the accident, and the other of whom first saw him forty-eight days after that event.

"On behalf of the defendant, six other surgeons were examined, several of them of the largest and most extensive experience, thoroughly competent in every way, all of whom examined the plaintiff's leg at different times, and every one of whom testified that in his opinion the leg was never fractured, giving his reasons with much detail. Dr. H., one of these witnesses, was of opinion that no fracture ever existed, and he attributed the present

condition of the plaintiff's leg to a high degree of inflammation, to caries, and a part of it to surgical interference subsequent to that,—operative procedure, in other words. A careful examination by him of the spine of the tibia disclosed no fracture, although a fracture such as described 'would most undoubtedly be shown, couldn't fail to be shown,' if it were there. Dr. J., a surgeon of forty years or more and a railway surgeon for over thirty years, and who had seen six or seven thousand cases of accident, testified that he had examined the plaintiff's leg three times, and, being asked whether there had been a fracture, said, 'There is no evidence to me that he had a fracture at the time stated nor of the kind referred to. I don't think he could have had such a fracture and have his limb present the appearance that it does at the present time.' He then explained fully to the jury the reasons for his opinion,—among others, that he had followed the spine of the tibia down to the ankle-bone, and it was perfect without any line of deformity, and that there was no evidence that the bone of the tibia had ever been thrown forward a quarter or half an inch. He also measured the legs and found them absolutely of the same length. Dr. B., a surgeon of large experience, found no evidence that there had ever been a fracture. Dr. O., a surgeon of more than forty years, with an enormous experience in the hospitals, in the army all through the war, and in his private practice, testified that he had examined the plaintiff's leg very carefully by feeling it, measuring it, and comparing it with the other leg, and the fracture as described by the plaintiff's surgeons having been explained to him, said, 'There is no evidence of there ever having been such a fracture.' He said he measured the leg and found no shortening in it; that he had run his finger down along the spine of the tibia and found no prominence or depression at the place of the alleged fracture. Drs. K. and F., both surgeons of more than twenty-five years, and largely in hospitals and railway service, found no evidence that the bone was ever fractured. In addition to all this, Dr. L., who treated the patient's leg after Drs. E. and C. were unable to help him, said that the plaintiff had tuberculosis of the tibia, and that he had treated him successfully for the disease, but found no evidence of a fracture."

Commenting on the testimony, as in the previous review, the Supreme Court said, "It is sufficient to say the great preponderance of testimony, and that which was best informed and most reliable, tended to show that there never was a fracture of the limb such as was testified to by Drs. E. and C. The most experienced surgeons easily accounted for the conditions to which the witness testified. Dr. H. said, 'I think the action of the patient in leaving the hospital was very injurious to his limb and was the cause of his condition at present.' He was asked, 'Q. Doctor, where there has been an injury to a leg in the region of the ankle, followed in a few days by severe inflammation extending in and around the joint, which leg is examined by a surgeon at the end of three weeks from the accident, at which time the periosteum is carried away or roughened, and

the bone roughened, and small pieces of bone have come away, would a physician be liable to be mistaken as to his diagnosis as to that being a case of fracture? *A.* He might be. He would be much more likely to be mistaken in his diagnosis than for the man to have gone home in that condition.' Dr. M., being asked whether he would not expect Drs. E. and C. to be correct in their diagnosis because they had examined the leg recently after the accident, said, 'I would expect them to be correct, and I would say that Dr. E. was correct if I hadn't examined this limb since and found that he was mistaken.' He was asked, '*Q.* Well, suppose he got his finger into the wound, would the disease, tuberculosis, be likely to develop such a state of affairs as to lead him to suppose that there was a fracture when no fracture existed? *A.* Yes. *Q.* How would that be? *A.* Well, if he got his finger into a bone that was denuded of its periosteum, and in which caries was going on, it would convey to his finger the same sensation that the ends of the bone would after having been rounded off by some little period of time; the same sensation would be conveyed to his finger, and also, if a probe was put in, the same sensation would be conveyed to the end of the probe as in the case of fracture, and in the case of disease he wouldn't be able to tell the difference.'

"Dr. E. never effected any cure of the plaintiff's limb, although he continued to treat him for about a year for fracture. He said, 'Well, he failed to improve after Dr. C. and I had operated on him several times. I sent him to the city of P., to the hospital, and gave him a letter to Dr. P. describing his case.' It was at this time that he came under the treatment of Dr. L., who said that he discovered no evidence of fracture, and treated him successfully for tuberculosis of the bone, which was the disease which he said the plaintiff really had.

"It must be remembered," comments the Supreme Court, "that nobody has ever seen this alleged fracture. Neither Dr. E. nor Dr. C. ever opened the leg and obtained an actual sight of it. So far as their testimony goes, it was simply their opinion that there was a fracture. But Dr. L. did open the leg down to the bone, and cut away a considerable quantity of decayed bone, and he said there was no evidence of fracture."

As to the first point, therefore, whether there ever was a fracture, and the plaintiff's right of recovery depending upon the existence of such fracture, the Supreme Court, considering the testimony as above reviewed, adds, "If there was no fracture there is not a spark of testimony in the case upon which a recovery could be based."

The second point of the case, whether the subsequent condition of suffering and illness of the plaintiff was produced wholly or partly by acts of contributory negligence on his part, will now be considered.

There was an attempt by the trial court, in the charge to the jury, to distinguish between the injury to the plaintiff, supposing he was negligently treated up to the time of his leaving the hospital, and the injury which resulted from his own negligence in leaving the hospital when he

did, and his subsequently going to W., remaining there five days without any treatment, and then travelling to B., upward of two hundred miles distant, for further treatment. "That the plaintiff's act of leaving the hospital," says the Supreme Court, "at the time he did, and in the condition he was then, was an act of negligence on his part cannot be questioned. Now, his subsequent conduct in travelling to W. and B., if it resulted in the severe consequences that followed, was still more negligent, according to the universal testimony of all the surgeons. Whether he would have been cured if he had remained at the hospital a longer time, as Dr. N. testified he would have been, cannot now be known because of his own voluntary act of leaving. It is impossible, therefore, to distinguish between the consequences which resulted from his ultimate act of leaving and those which might have resulted if he had remained. He might have been cured if he had remained, or he might not, and it is not possible now to determine that question. But that impossibility results from his own action, and therefore no distinction can be made, as the source of a right of action, between the consequences which might have happened had he remained and the consequences which did happen after his departure. The answer that it is not possible to determine that question is because, notwithstanding his sufferings, he might have recovered if he had remained. Now, as to his subsequent contributory negligence the evidence is simply overpowering, and is not really contradicted. Nearly all the surgeons were inquired of as to that, and they all concurred in their views." The evidence here referred to is as follows: Even the plaintiff's own surgical witness, Dr. E., admitted that his travelling from the hospital to W., and from there to B., would have a very bad effect upon the patient. He was asked, after describing in the question the journey and the leg, and the effect upon it, "Q. And the bones would cut through the flesh? A. They might. Q. Well, they did it, didn't they? A. Well, there was a hole there. Q. And wouldn't everything you saw in relation to that man's condition, as he came to you at Bedford, be explainable upon the idea that in this travelling and this motion the fragments had cut themselves through the skin? A. It might have produced the result; yes, sir. Q. And didn't you swear on the last trial of this case, 'The bones would cut as R. was walking around and moving the limb, the ends of the bones would cut as the muscles would contract, would draw apart and injure the soft parts, and open the skin to the outside, by which germs would get in there and produce the condition I found him in'? A. Yes, sir; that is correct. . . . Q. Could fragments of the bone cut their way through the flesh in less than six days, and hasten blood-poisoning? A. Yes, sir. Q. Was the inflamed condition of the wound, the death of the bone, and blood-poisoning attributable to inflammation, 'caused by the moving of his limb about, laceration, and abscesses, and entrance of air to the injury? A. I think so; yes, sir.'"

Dr. H. was asked a long question which described the movements of

the plaintiff after leaving the hospital, as testified by himself, and at the conclusion he was asked, "Did the action of the plaintiff contribute to produce this condition, as found by the doctors on his arrival at B. and subsequent thereto? A. Well, most emphatically. If the man only had an injured joint, if he had an inflammatory action there at all, that would be, I consider, almost suicidal for a man to attempt anything of that kind, and, if a fracture existed, as a matter of course it would be a great deal worse. Q. What would you say as to the possibility of a man making a trip, and making the movements as I have described them? A. What do you calculate in the possibility, fracture as described in this case? Q. Yes. A. Well, I don't know anything about a man's physical endurance, but it doesn't seem possible to me that a human being would be able to undertake an action of that kind." And the witness then explained at length the reasons why it could not be done. Dr. J. was asked the same long question as Dr. H., and his answer was, "Assuming that he had that condition of limb, and that he survived and did all those things, it is a wonder he is alive." And again, "I think the action of the patient in leaving the hospital was very injurious to his limb and was the cause of his present condition. I can't think otherwise." He further testified that he did not believe the plaintiff had any fracture, because he could not possibly make such a journey if he had.

Dr. M. was asked the same question, concluding with the inquiry whether the journey contributed to the condition in which the plaintiff was when he reached B., and his reply was, "My opinion would be that that would be entirely sufficient to account for the conditions that were found by Dr. E. at the end of the journey."

Drs. B., D., and O. gave similar answers to the same question, the latter adding that it would have been utterly impossible for the plaintiff to make the journey with such a fracture at the time. Dr. K. also said, in reply to the same question, "Yes, sir, the travel would do that." When asked to give his reasons he said, "Well, if he had a fracture without a splint on, the movement of the fracture caused by his travelling would so irritate the surrounding parts that inflammation would set up, and the probability is that owing to the proximity of the artery of the foot to these fragments, admitting that it was a fracture, the sharp edges of these fragments would probably cut off the artery, or at least endanger it; at any rate it would get up such an inflammation that the foot would be gangrenous; it would produce gangrene of the foot, provided he went through all detailed."

(To be continued.)

BOOK REVIEWS.

A MANUAL OF VENEREAL DISEASES. By James R. Hayden, M.D. 8vo, pp. 267. New York and Philadelphia: Lea Bros. & Co. 1896.

This little work, the author tells us, is intended to be an epitome, and, omitting the statistical and historical sides of the subjects embraced under its title, the practical or clinical side, which is that mostly sought for by student and practitioner alike, is that which is described.

The work commends itself at once to the reader on account of its brevity and clearness of style. Part I. is devoted to the discussion of gonorrhœa and its complications, and, on the whole, is well written and practical, although one would expect nowadays to see more prominent mention made of antiseptic medication in the treatment of urethritis. We are a little surprised, too, to find how frequent an occurrence, according to the observation of the author, the involvement of the posterior urethra is. He tells us that "in from eighty to ninety per cent. of all cases of acute anterior gonorrhœa the disease passes rapidly down the urethra to the bulb, and thence into the posterior portion, so that posterior urethritis, instead of being a complication, as was formerly thought, is in reality the usual course of the disease."

The chapters devoted to the discussion of stricture of the urethra, its diagnosis, and its treatment are surprisingly full and comprehensive for a work of the size of this, the fifty pages devoted to this matter containing in a well condensed form excellent descriptions of methods and procedure in treatment, every step being so well depicted that even the most inexperienced could not go astray were he to adhere closely to the directions given.

In Part II. the chancreoid and its complications and their treatment are described. We are glad to see that the writer is not a believer in routine cauterization of chancreoids, reserving this measure for those sores which show a tendency to destroy surrounding parts.

The third and last part of the work is taken up with the subject of syphilis, which is described in a very terse and satisfactory manner, the descriptions of the eruptions being especially good. The narrations of the syphilitic affections of the various organs of the body are good, and quite sufficient to convey to the mind of the reader clear ideas on the subject. In the matter of treatment the writer believes that it should be intermittent, and not continuous in character, but believes that its duration should be from two to three years.

This little volume is, on the whole, quite up to date. It is well written, and, for the purposes for which it is intended, will be found very useful.

T. R. N.

THE PHYSICIAN'S VISITING LIST FOR 1897. Philadelphia: P. Blakiston, Son & Co.

This well-known pocket visiting list is now in the forty-sixth year of its publication. The publishers evidently expected that better times are in store for the practitioners of medicine in 1897, as they have added twelve pages to the space allotted to the cash account above that given to this department in their last edition.

H. W. C.

A VEST-POCKET MEDICAL DICTIONARY. By Albert H. Buck, M.D. William Wood & Co. 1896.

An excellent reference book of over 500 pages, $3\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$ inches. We looked for a number of drugs before noticing on the title-page that these are excluded from the work. The medical student, for whom, of course, the work is primarily intended, wants information in regard to spelling and dose as much as anything else for which he desires a dictionary. Much increase in size could be guarded against by a careful selection of the words introduced.

H. W. C.

FOOD IN HEALTH AND DISEASE. By I. Burney Yeo, M.D., F.R.C.P.; Examiner in Medicine at the Royal College of Physicians; Professor of Clinical Therapeutics in King's College, London, etc. With illustrations. New and revised edition. Philadelphia: Lea Brothers & Co. 1896.

Within late years the members of the medical profession at large have had their attention called to the importance of a knowledge of "food stuffs," their uses and abuses, together with the conditions affecting the nutritive value of same.

Upon this subject many eminent writers have contributed volumes. The general profession more than ever appreciate the fact that diet is an important factor in the cause and cure of many chronic affections, while a number of specialists rely largely on systematic feeding and rest as a most important adjunct to successful treatment. In the work under consideration, Dr. Yeo has given a most instructive and interesting contribution to this science, a "practically useful guide to the subject of dietetics," and we consider it a valuable addition to the physician's library.

The book is well systematized, and divided, primarily, into two parts, Part I. treating of "Food in Health," Part II. of "Food in Disease." Part I. includes a number of interesting chapters, among which are classification of foods, metabolism, cooking, preparing and preservation of foods; certain complete dietaries, as prison, soldiers', and seamen's dietaries; food in relation to age and condition, and relative value of animal and vegetable foods, vegetarianism, etc.

In Part II. Dr. Yeo gives complete chapters on the dietetic treatment of disease and convalescence. Among these we note diet in diseases of digestive organs, including dyspepsia, acute and chronic gastric catarrh, constipation, etc.; diet in albuminuria, diet in gout and calculous disorders, diet in acute and chronic rheumatism, rheumatoid arthritis, etc.; diet in skin-diseases, dietetic treatment of obesity, etc.; also contains special dietetic cures, as the dry cure, milk and whey cure, the koumiss cure, the grape cure, etc.; artificial digestive agents and artificial alimentation, etc.

There is an interesting appendix, including five chapters, on hospital dietaries, the sterilization and Pasteurization of milk, an invalid's dietary, and numerous selected recipes.

Although all chapters are quite complete in themselves, we think a few worthy of special mention.

In Part I. the chapter on "Food in Relation to Age and Condition" would be a valuable addition to any work on practical medicine. It embraces the subject of "Food in Infancy and Childhood," discussing the various substitutes for milk and comparative value of infant foods in general; infant feeding, a list of diets for training, and food at school, the importance of proper food and care during this epoch of one's life being particularly emphasized. The chapter on "Annexation of Foods" explains clearly the functions of the various secretions of the gastro-intestinal tract, with a study of absorption and assimilation. The nutritive value of the various articles of diet and their digestibility are also spoken of at length.

A thorough knowledge of these subjects is essential to the intelligent application

of the dietetic remedies suggested in Part II., particularly in that chapter devoted to the dietetic treatment of diseases of the digestive organs, in which Dr. Yeo, besides explaining most clearly the pathological conditions attending the different affections coming under this head, includes a number of diets for the prevention and treatment of these common complaints.

Simple suggestions as to the dietetic treatment of adult and infantile diarrhoeas close this instructive chapter.

Chapter III. of Part II. treats of food in diabetes, and is probably the most exhaustive in the book.

The various pathological theories that have been advanced to explain this state are broadly discussed, and numerous tables of diet for slight, medium, and grave cases are appended. The relative value of different mineral waters recommended is also considered. The chapter on food in rickets, scrofula, and consumption is also very complete. In connection with the subject of pulmonary consumption, an extract from Dr. Weber's lectures calling attention to the possibility of a relationship between the life of the tubercle bacilli and quality and quantity of food taken, especially salts, offers subject for much thought and investigation. The book throughout is well written, comprehensive, and all the statements and suggestions are based upon recent scientific investigation.

We take pleasure in recommending it to students and physicians.

R. S. J. M.

DEFORMITIES: A TREATISE ON ORTHOPÆDIC SURGERY. By A. H. Tubby, M.S., London, F.R.C.S., England. 8vo. Illustrated, pp. 598. Price \$5.50. Macmillan & Co., 1896.

The appearance of a new work on orthopædics shows the continued activity in this special branch of surgery. The present volume is the outcome of several years' work in the special London hospitals, and is particularly interesting as an illustration of transatlantic practice. The writer has paid especial attention to the repair of tendons, and has repeated the celebrated experiments of Mr. Adams in view of the wider pathological horizon of the present day. In regard to the immediate rectification of deformities after tenotomy, we are surprised to find that he still advocates the gradual method, a practice which differs essentially from the methods here employed. The work does not include all phases of the diseases of the bones and joints, such as tubercular osteitis and arthritis of the hip and knee, as the English practice, unlike our own, does not include these. The definition of orthopædic surgery in the latest American work, "*Young's Orthopædic Surgery*," includes "the preventive, mechanical, and operative treatment of chronic and progressive deformities."

The author has quoted liberally from standard works, and has expressed his sense of indebtedness to the many admirable writers who have recorded their experiences in the *Transactions of the American Orthopædic Association*.

As a reference work for practitioners and advanced students, the work is admirable, but as a text-book it is not as desirable as some of those already in the field.

The illustrations are excellent and the publishers deserve praise for the beautiful appearance of the book.

J. K. Y.

ITEMS OF INTEREST.

ON October 16, 1846, the operating theatre of the Massachusetts General Hospital was the scene of the most important discovery in the domain of surgery since surgical practice began. On that day Dr. William Thomas Green Morton demonstrated, before a number of Boston's foremost surgeons, the practical application of the vapor of chloric ether to the relief of pain during surgical operations. The claims of Dr. Morton, who was a Boston dentist, had met with the usual amount of scientific scepticism, and even at the hour of his success failure seemed to be about to reward his efforts. Dr. Morton first successfully extracted a tooth from a man named Eben Frost, who had previously been put under the influence of the vapor. The medical and scientific world were then apprised of the discovery through an operation which Dr. J. Collins Warren performed at the Massachusetts General Hospital on one Gilbert Abbott for the removal of a vascular tumor beneath the left side of the mandible. Dr. Morton, who was somewhat troubled in finding a suitable inhaler with which to administer the vapor, was a little late in arriving at the hospital on the day of the operation, and when he reached the operating room he found Dr. Warren about to begin the incision. In a short time the patient was etherized, and the tumor was removed without painful sensation of any sort to the patient. The records of the hospital say that Abbott experienced "only a sensation like that of scraping the part with a blunt instrument." At the conclusion of the operation Dr. Warren said to the wondering audience, "Gentlemen, this is no humbug." Other cases were operated upon in quick succession, and the use of the drug has become in our day a routine practice. Our English brethren who heretofore have been loud in their praise of chloroform are gradually forsaking their allegiance to that drug and are becoming advocates of ether as the safer anæsthetic. Possibly the tenacity with which the English surgeons have clung to the use of chloroform may be explained by the fact that Sir James Y. Simpson was the first to describe the practical application of the drug.

The fiftieth anniversary of this important discovery was celebrated in France by a commemorative festival on a large scale, which was organized by the Medical Press Association. The committee was composed of such men as Cornil, Lucas-Championnière, Lannelongue, and Reclus. The Society of Anæsthetists, of England, also celebrated the event. In Boston

the discovery was commemorated by a jubilee celebration held at the Massachusetts General Hospital. The following is the programme of the exercises of the day.

Address of Welcome, by Charles H. Dalton, Esq., President of the Massachusetts General Hospital.

"Reminiscences of 1846," by Dr. Robert T. Davis, of Fall River, and Dr. Washington Ayer, of San Francisco.

"Surgery before Anæsthesia," by John Ashhurst, Jr., M.D., of Philadelphia. Published in the last number of the INTERNATIONAL MEDICAL MAGAZINE.

"What Anæsthesia has Done for Surgery," by David W. Cheever, M.D., of Boston.

"The Birth and Death of Pain," a poem by S. Weir Mitchell, M.D., of Philadelphia.

"Relation of Anæsthesia and Obstetrics," by John P. Reynolds, M.D., of Boston.

"The Influence of Anæsthesia upon Medical Science," by W. H. Welch, M.D., of Baltimore.

"The Surgery of the Future," by Charles McBurney, M.D., of New York.

"The New Guide to the Press" (*Le Nouveau Guide de la Presse*) is the title of a publication which will shortly appear in Paris. This paper will give the most detailed information concerning all the journals and periodicals appearing in France and in foreign countries. Besides the ordinary descriptions, the names of the collaborators and principal correspondents and the price of subscription will be given. The work will be the most complete of its kind which has appeared up to the present time.

A New Publication
Concerning Con-
temporaneous Lit-
erature.¹

Reference to its contained material will be very easy because the journals are classified not only by cities but also by periodicity, opinions, politics, and subject. M. E.-G. Raymand is the editor.

In the death of Sir John Erichsen, which occurred September 23, the medical profession as a whole and the British surgical profession particularly loses one of its leaders. Sir John Erichsen was born in 1818 of Danish parents. He received his medical education at the University College Hospital, London, under the guidance of Liston. At the early age of thirty-two he was appointed professor in the University College and became professor of clinical surgery in 1866 on account of the vacancy left by the death of Quain.

The Death of Sir
John Erichsen.

¹ Bulletin médical du Nord, August 28, 1896.

He held this position until 1875, and during the time that he held the chair he became famous as a clinical instructor. His fame as an author is no less great than his popularity as a teacher. Among his published works may be mentioned "The Science and Art of Surgery," which appeared in 1853. This work was for a long time the English authority in surgery. During his career he has been at different times president of the Royal College of Surgeons of England, president of the Royal Medical and Chirurgical Society, president of the Surgical Section of the International Medical Congress of 1881, and, at the time of his death, emeritus professor of Surgery in the University College. Sir Joseph Lister was one of his pupils.

The second session of the International Congress of Obstetrics and Gynecology was held at Geneva during September of this year. The president, M. Aug. Reverdin, occupied the chair. The first session of this Congress was held at Brussels in 1892, and the next will be held at Amsterdam. More than two hundred foreign colleagues were registered at this meeting. Addresses were made at the opening session by M. Lachenal, president of the Confederation; by the counsellor of state, Richard; and Drs. Simpson, of Edinburgh; Kebra, of Heidelberg; Polk, of New York; Tournay, of Brussels; Charpentier, of Paris; Gutierrez, of Madrid; Stauch, of Moscow; Morisani, of Naples; Lindfers, of Sweden; and Chadwick, of Boston.

Among the important questions discussed were the treatment of pelvic suppuration; the treatment of retrodeviations of the uterus; the relative frequency and the most usual forms of narrowing of the pelvis in different countries, groups of countries, and districts; and the treatment of eclampsia.

Henri Durant, who originated the Red Cross Society, the good deeds of which in time of war and of pestilence need not be dwelt upon here, is sick and penniless in his old age. It should be the duty as well as the privilege of all nationalities to contribute to a fund which a special committee in Stuttgart is endeavoring to raise in his behalf. The committee has issued a circular which, in part, says, "He was an international hero. It should be the concern of all the people to charge themselves with the care of one who has cared so wisely and successfully for his fellow-men." Contributions may be sent to the committee, in care of the Burgomaster of Stuttgart. There should be a generous response to this appeal.

The International Congress of Obstetrics and Gynecology.¹

The Founder of the Red Cross Society.²

¹ Gazette des Hôpitaux, September 15, 1896.

² American Medico-Surgical Bulletin, September 13, 1896.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. V.]

JANUARY, 1897.

[No. 12.

ORIGINAL COMMUNICATIONS.

SYRINGOMYELIA.

*BEING THE ALVARENGA PRIZE ESSAY OF THE COLLEGE OF
PHYSICIANS OF PHILADELPHIA FOR THE YEAR 1895.*

(Concluded from page 706.)

BY GUY HINSDALE, A.M., M.D.,

Philadelphia.

In Oppenheim's case Clark's column was atrophied on the left by compression and atrophied on the right by degeneration. In the lower part of the dorsal cord the columns of Goll were degenerated. Lower down the degeneration is diffused throughout the two posterior fasciculi, and diminished from above downward to the lumbar region. The degeneration of Clark's column occupied in the same extent the right side, while the left column (the side of the lesion) had retained its normal character.

At the seat of the lower portion of the glioma the degeneration of the posterior right column was still active.¹

The latent form of syringomyelia referred to by some authors includes those cases where no manifestations of the disease were noted during life, but where the true diagnosis was established at the autopsy. It is quite likely that if these unrecognized cases had been more closely studied during life, sensory disorders and other symptoms would have been given their proper weight. It would seem, therefore, that this class of cases would be likely to play a less conspicuous part in the classification of the various forms of the disease.

It has been claimed that in the latent form the lesion may exist in the periependymal region, and yet there be no disturbance of the functions of

¹ Archiv für Psychiatrie, 1893, vol. xxv. p. 315.

the white or gray matter of the cord. A lesion localized on one side may not necessarily be revealed in any objective symptoms referable to that locality, for, although we are not able to say just how far compensation may exist or what the channels of commissural innervation may be, it is reasonable to believe that the function of one side may be more or less completely performed by corresponding nerve-cells of the opposite side by means of commissural communications, which physiologists teach us have an existence. We are not in a position as yet to state just how these commissures act.

SYRINGOMYELIA ASSOCIATED WITH OTHER DISEASES.

Hysteria.—A few of the reported cases present hysterical symptoms. An excellent example is that reported recently by Dr. Agostini, of Perugia. The woman was thirty-five years old, and gave a family history of alcoholism, phthisis, and nervous derangements. Her present illness began four years ago with neuralgic pains in the left scapular region, and with formication and a feeling of weight and debility in the arms, first affecting the pectoral region, then the arms, forearms, and, lastly, the hands. At the same time she developed hysteria, paraplegia, and aphasia, and later on the classical convulsions of hysteria major. These symptoms persisted for two years, and were finally treated successfully by hypnotism.

Muscular force of right hand, thirty; of left, five. Marked atrophy of the muscles of the forearm, of the interossei, and of the thenar and hypothenar eminences.

Tactile sensibility is generally preserved, save on the posterior part of the left upper arm, where hyperæsthesia is present. Sensation of heat and cold and of pain are abolished from the neck to the ninth intercostal space and in the left arm. Muscular sense is intact, likewise sense of taste, sight, and hearing. Visual fields concentrically contracted. Pupils do not react. Exaggeration of the muscle and tendon reflexes. Reaction of degeneration in the muscles of the thenar and hypothenar eminences.

Agostini concludes as follows:

1. Syringomyelia may be associated with hysteria, and confusion may arise when the difference pertains to sensibility alone.
2. The presence of progressive muscular atrophy, accompanied by diminished electrical excitability, persistence of the muscular sense, point to a syringomyelic affection rather than an hysterical.
3. The best diagnostic criterion in this and other neuropathic affections is hypnosis, in which muscles with anatomical lesions do not pass into the cataleptic state.

Cases of syringomyelia and hysteria have been recorded by Charcot and Asmus.

Syphilis of the Central Nervous System.—This has been observed in connection with syringomyelia by Eisenlohr, Nonne, Jegorow, Beevor, Souques (339), Sinkler (333), Rosenblath (303).

It is liable to give rise to difficulties in diagnosis.

Lepra.—A vigorous controversy has arisen as to the relation of this disease to cases reported as syringomyelia, particularly of the type Morvan. Zambaco and others have maintained that Morvan's disease, so called, is nothing more than anæsthetic leprosy. There is no doubt that a strong analogy does exist in some cases between the symptoms of these affections and, to a less extent, scleroderma, ainhum, the tropho-neuroses, morphœa, and symmetrical gangrene. In discussing this subject before the Sociedade das Sciencias Medicas of Lisbon, Dr. Falcao expressed the opinion that Morvan's disease and syringomyelia are in reality anæsthetic leprosy, but he believes that the other affections cannot be classed with this disease. Dr. Falcao was consulted by a patient from Para who presented the following symptoms: Atrophy of the thenar and hypothenar eminences, interossei, and some muscles of the forearm, anæsthesia, bent fingers, and thickening of the ulnar nerve. Dr. Falcao made the diagnosis of *lepra anæsthetica*, which was justified not only by the symptoms present, but by the fact that the patient came from a country where leprosy is a common disease. Subsequently this patient went to Paris to consult Professor Charcot, from whom, it is said, he received a written statement to the effect that the disease in question was syringomyelia.

The *Gazeta Medica da Bahia* relates the celebrated case of a Frenchman named Mares, who for more than seven years appeared in the hospitals of Paris as a case of Morvan's disease. Professor Hayem and Monod confirmed this diagnosis, and the latter amputated several fingers of Mares, and published in the *Archives de Médecine et de Chirurgie* his observations of this case, which he regarded as a typical one of Morvan's disease. Later on, Broca confirmed the previous diagnosis and amputated two fingers of this patient. Again Hayem took charge of him, and amputated another finger. Several months later Mares was admitted to the Saltpêtrière, where Professor Charcot had him photographed, and for eleven months exhibited him to physicians and students as a case of Morvan's disease. Later on, Charcot diagnosed Mares's case as syringomyelia, type Morvan. Finally, this patient was admitted to the Hospital de Bicêtre, where Déjerine did not agree with Charcot as to the identity of these two affections, and stated that Mares had simply Morvan's disease. Gombault, who had made several histological examinations of the amputated fingers of Mares, admitted the diagnosis of Déjerine,—Morvan's disease. Dr. Zambaco procured the address of Mares, and, after examining him at his residence, he was convinced that he had before him a case of leprosy. In this it is reported that he was sustained by Vidal, Besnier, Tournier, Hallopeau, Quinquaud, Du Castel, and Tenneson.¹

A genuine case of syringomyelia associated with leprosy, confirmed by

¹ See article by Dr. Alvarez, of Hawaii, *Pacific Medical Journal*, January, 1895. Also *Semaine Médicale*, 1893, pp. 289, 295.

both a bacteriological examination and an autopsy, has been recorded by Souza-Martin and L. da Camara Pestana. (See case, *Semaine Medicale*, No. 20, 1894.) The autopsy revealed in the cervical region a cavity involving the gray and white substance. The cavity was filled with a brown, diffuent mass. In preparations of this substance stained by immersion for six minutes in the carbolyzed fuchsine of Ziehl, then decolorized by nitric acid, he was able to find a great number of bacilli disposed in groups of the length of four μ , presenting clear spaces separated by strongly colored granulations which were found usually at the extremity of the bacillus. These characters are those of the bacillus of Hansen (lepra).

In this instance a case of syringomyelia diagnosticated two years before death has confirmed, for the first time, the ideas enunciated by Zambaco.

While it is not possible to conclude from this one case the etiologic unity of syringomyelia and leprosy, it leads us to recognize that the syringomyelic affection of the type Morvan may afford an easy entrance for the bacillus of lepra.

In leprosy with nervous disturbance the disease seems to depend on a neuritis,—i.e., that tactile sensibility is involved as well as the other forms of sensibility. In very rare cases,—e.g., that of Rosenbach,—we find at the seat of the macules preservation of tactile sense with alteration of temperature and pain sense.

The distinguishing features are as follows :

Syringomyelia.—Disassociation of sensory disturbances ; integrity of superficial muscles of the face ; absence of discolorations on the skin ; hair unaffected ; deviations of the spine.

Anæsthetic Leprosy.—Abolition of tactile sense ; atrophy and paresis of the superficial muscles of the face ; thickening and nodulous swellings of nerves ; discolorations (painless) upon the body. Zones of anæsthesia and thermo-anæsthesia irregularly distributed in the shape of plaques with sharp transition from the affected to the normal areas.

These spots or islets of anæsthesia are circumscribed by a reddish line a little raised and very irregular.

In syringomyelia, on the contrary, the anæsthetic zones of thermo-anæsthesia occupy large areas limited by regular lines.

Souza-Martin goes to the extreme in denying that syringomyelia is a nosological entity, and affirms that it is merely a condition that confronts us and not a disease *per se*. He attempts to claim that it is similar in a certain sense to cavernous affections in the lungs, which he says we might just as well call syringopneumia ; in other words, the condition known as syringomyelia may be present in various diseases, among which he reckons leprosy. It is needless to say that we dissent entirely from his views.

As to the relationship of lepra and syringomyelia we believe that an individual who may exhibit symptoms of syringomyelia or Morvan's disease may have, in addition, leprosy. For example, this was recently observed

by Pitres and Sabrazes in what they report as a case of systematic nervous leprosy of syringomyelic type. It required a bacteriological examination to determine its real nature. To accomplish this it was necessary in one case to excise a portion of the neuritic nerve from the living subject. The bacillus was found in large numbers, limited, however, to the nerve-fasciculus itself, none being found in the perineurium, the intrafascicular tissue, or in the vessels.

In three other cases where the bacillus was searched for and not found the conclusion was reached that leprosy and syringomyelia are distinct effections, both as to etiology and nature, notwithstanding that certain analogies are present in their symptoms. The weight of authority is in favor of the duality of the diseases, Zambaco being the principal claimant for their identity.

Syringomyelia and Chronic Hydrocephalus.—This combination points to the developmental origin of syringomyelia. Out of one hundred and thirty reported cases examined Rupferberg found fifteen in which a syringomyelia or hydromyelia accompanied a chronic idiopathic hydrocephalus. The cases of syringomyelia were those of Langhans (4), Westphal, Kiewlicz (1), Chiari (2), to which we add those of Vought and Schlesinger (Obs. 13). The latter has also recorded a case of hydrocephalus, idiocy, and syringomyelia combined. (Obs. 29.)

Spina Bifida.—This affection furnished the cases in which some of the earliest observations of syringomyelia were made. It is more distinctly related, however, to hydromyelia. (See cases of Pagenstecher.)

Tumors of the pons, cerebellum, and cerebrum have been found in cases reported by Gowers, Harris, Kronthal, Hoffmann, and Schultze.

Cervical Hypertrophic Pachymeningitis.—In Rosenblath's case this was believed to be the primary condition and the syringomyelia to have developed later. Other cases have been reported by Raymond and Critzman.

Acromegaly and Cheiromegaly.—Marie exhibited about a year ago before the Medical Society of the Hospitals of Paris a case of this character. The patient was a young man of twenty-one, having syringomyelia. His right hand and left foot had for some years been much increased in size. Charcot and Brissaud have also described a form of trophic affection of the bone under the name of cheiromegaly, which, as the name implies, is an increase in the size of the hands and fingers analogous to acromegaly. Holschevnikoff and Recklinghausen have described cases of syringomyelia with acromegaly; it is quite likely that the latter is only a trophic disturbance entirely secondary or a part of the primary syringomyelia. Hoffmann (Obs. 12) and Karg have published similar cases. (See Frederick Peterson's case.)

Amyotrophic Lateral Sclerosis.—Lloyd's case. (See Figs. 8, 9, 10, and 13.)

Friedreich's Ataxia.—This disease is probably closely related to syringomyelia. The motor symptoms, the spinal curvature, the trophic and vasomotor symptoms, to a slight extent the sensory disorders, the bulbar symp-

toms, and particularly the nystagmus, all point to the intimate relationship of the two affections. Further than this, in three out of the twelve autopsies in cases of Friedreich's ataxia collected by Griffith cavities have been found.

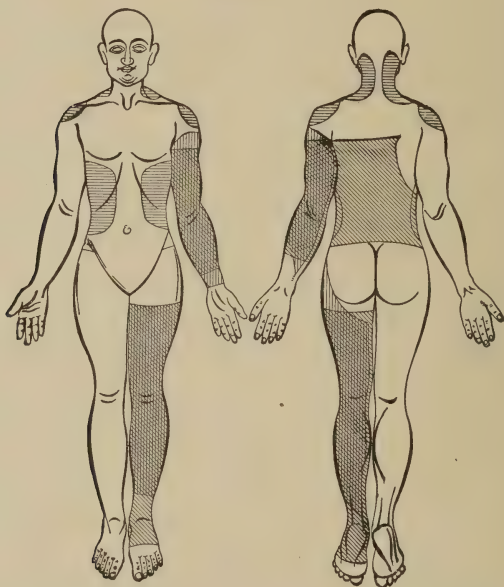
Among other diseases which have been noted in connection with syringomyelia we have Basedow's disease (Joffroy and Achard), pellagra (Pel-lizi), Friedreich's disease (Friedreich, Déjerine, Letulle), general paralysis and dementia (Fürstner and Zacher, Kanasugi, Hoffmann, Czerny), chronic chorea (Duchenne and Hoffmann), idiocy (Arndt), melancholia (Schuele, Meyer), mania (Defoix), and cancer of the stomach (Jeffries).

The mental state is, as a rule, undisturbed unless bulbar involvement ensues.

DIAGNOSIS.

So much has been said in the foregoing chapter on the relation of this to other diseases that a full discussion would involve much useless repeti-

FIG. 27.



SYRINGOMYELIA.—Showing analgesia (vertical lines), thermo-anesthesia (oblique lines), tactile anesthesia (horizontal lines). This case was associated with amyotrophic lateral sclerosis.

tion. It may be said in general that the diagnosis of syringomyelia now rests upon a firm foundation, and, in a classical case, ought to present no difficulty in forming a correct opinion during life. In fact, the diagnosis is repeatedly made *intra vitam* and corroborated at the autopsy, and that too in cases that depart in some degree from the typical form. It naturally happens that where trophic changes assume prominence, or in cases of amyotrophy or amyotrophic lateral sclerosis, or those cases in which the disease is said to be latent, difficulties will arise. But, whatever the predomi-

nating form, we must depend for our diagnosis and lay great stress on the more characteristic signs of the disease, particularly sensory troubles and the dissociation symptom. This is not, however, an infallible guide.

Clinical observations prove that the dissociation of sensibility exists in circumscribed neuritis or polyneuritis as well as in the neuritis of leprosy (Leloir, Babinski, Thibierge, Pitres and Sabrazes, Chaffard, Rosenbach, Ziehl, Nothnagel, Ferrannini), in alcoholic neuritis (Lancereaux, Lemoine), in neuritis with tabetic symptoms (Joffroy and Du Cazal and Parmentier), and in the neuritis following trauma, as in a case of Charcot's.

In this instance a gunshot wound of the neck produced an injury to the nerve-roots with the occurrence of thermo-anæsthesia.¹ Lloyd's cases of traumatic affections of the spinal cord are also cases in point.

As a rule, the dissociation symptom is observed in all reported cases, but there are a few in which this symptom is not stated to have been observed, but where other important disorders of the nervous system have existed, and at the autopsy a syringomyelia was found (Schuele, Strümpell, Schultze, Schlesinger, Obs. 6). Unless one makes a practice of examining in a careful manner the state of the various kinds of sensibility in all cases of nervous disease, it will be quite likely that cases of syringomyelia will be allowed to pass as hypochondriac, neurasthenic, or as suffering from neuritis, arthritis, etc. Cases of unusual joint-disease should always excite our suspicions, and should be tested for thermo-anæsthesia and analgesia. So also in any case of spontaneous fracture or repeated dislocation in a case of arthropathy.

On the other hand, a diagnosis of syringomyelia may be erroneously made in instances of syphilitic tumors of the spinal cord. Such a case has been recorded by Dr. Beevor, of London. A gardener, aged fifty years, after two days' exposure to wet in July, 1892, began to drag the left leg. In a few hours he had weakness of the left arm and numbness of the right knee. "He noticed the weakness of the left limbs for a fortnight before admission, as well as wasting of the left arm." On the right side the numbness spread up to the groin, and during the last fortnight to the nipple. He had no pain till a week after the onset of the symptoms, when he began to have pain in the left shoulder, elbow, and wrist, and numbness in the left thumb and radial border of the forearm. There was no affection of the sphincters, and no history of gonorrhœa or syphilis. On admission into the National Hospital for the Paralyzed and Epileptic, in September, 1892, he had wasting of both the upper limbs, especially the left, with marked wasting and loss of power in the left serratus magnus, supinator longus, muscles of the forearm, and intrinsic muscles of the left hand, as well as weakness of the left lower limb, so that he could only just raise the leg off the bed. Sensation was lost to pain, heat, and cold of the whole of the right leg and the right half of the trunk up to the fourth rib, while tactile

¹ Clinique des Maladies du Système nerveux, Paris, 1892, p. 333.

perception was normal. The knee-jerk was excessive on the left side, and left ankle-clonus was present. Later, the loss of painful sensation spread up to the right arm (ulnar border) and left forearm, involving the radial border. There was loss of electrical reactions in the intrinsic muscles of the hand. Later, he had paralysis of the sixth nerve of the right side, and he gradually became worse, and died on November 14. On examination post mortem, two syphilitic tumors were found on either side of the brachial enlargement of the cord, the left one passing nearer the cord than the right, but the cord was too soft for accurate examination.

The following statement of the similarity of symptoms and of points of divergence will be useful in distinguishing syringomyelia from atrophic paralyses :

	Progressive Mus- cular Atrophy.	Amyotrophic Lateral Sclerosis.	Syringomyelia.
Age.....	25 to 35.	25 to 35.	20 to 45.
Sex.....	Male.	Male.	Male.
Onset.....	Gradual.	Gradual.	Gradual.
Course.....	Progressive.	Progressive.	Progressive with remission.
Muscular atrophy	Marked.	Marked.	Marked in the arms.
Tactile sense	Intact.	Intact.	Intact.
Pain sense.....	Normal.	Normal.	Lost.
Temperature sense.....	Normal.	Normal.	Lost.
Tendon reflexes.....	Diminished or 0.		

COURSE AND PROGNOSIS.

The disease is essentially a chronic, afebrile one, lasting generally for a considerable length of time. Patients have been known to live forty years after the onset of the symptoms. Remissions are liable to occur in the course of the disease, and at least two patients, one of Bruhl and one of Schlesinger, have died at the age of seventy-three years. Harken, however, believed that he saw it take an acute course in one instance. The prognosis is unfavorable. Death may come gradually by progress of the disease, producing cachexia, emaciation, bed-sores, etc., or, particularly, by the aggravation of certain symptoms of the disease, such as trophic disturbances, panaris, phlegmon, or vesical disorders. Intercurrent affections, such as tuberculosis, etc., are common terminations.

TREATMENT.

Medical.—Pain very commonly demands relief. Owing to the chronic nature of the malady it is better to rely on preparations like antipyrin, acetanilid, or phenacetin than to begin the use of opium. Bromides and chloral will also be occasionally required. Lukewarm baths are often of considerable use. Revulsive applications of hot and cold water along the spine are sometimes useful, but care has to be taken on account of the liability to trophic disorders of the skin. On this account the cautery would be liable to give trouble. Tonics, such as iron and arsenic, phosphide of

zinc, nitrate of silver, and iodide of potassium, have all been used to palliate the condition.

Surgical.—Local treatment for panaris or ulcers on the extremities, for cracks or slowly-healing sores the result of unfelt burns, and for boils will be demanded. It is for the relief of these affections that patients commonly consult a physician or surgeon. It is important to secure the healing of obstinate cracks and fissures so as to prevent septic infection. The analgesic skin should be protected from injury. It will be necessary to avoid hard labor, and, to counteract atrophy, it will be useful to use massage and electrical stimulation.

In cases where arthropathy with fluid develops, a surgeon may be needed either to aspirate the affected joint or for the removal of inconvenient osteophytes or for the closing of a persistent sinus. In an extreme case resection of the joint has been required. Surgical operations, however, are attended with more risk in these cases than in ordinary subjects.

CASES.

CASE I.—Robert C., colored, aged thirty-one, born in the United States; weight one hundred and eighty pounds, height medium; previous occupation, boot-black.

Father drowned; mother, alive; three sisters died of phthisis.

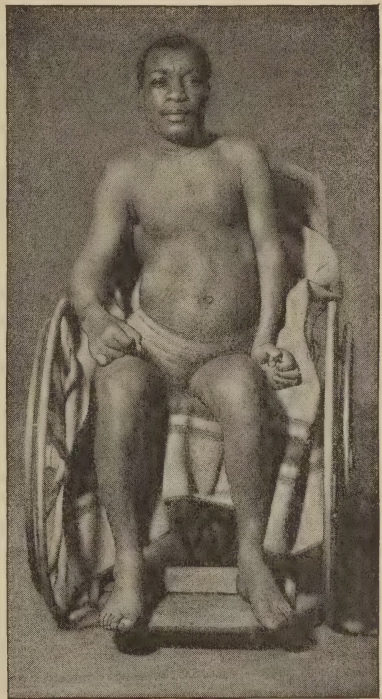
He gives a history of "erysipelas" in infancy; otherwise the patient has always been healthy, but has been an extensive masturbator. He denied syphilis or gonorrhœa. At the age of ten he was run over by a heavy wagon, his right leg being severely injured.

The present disease began when sixteen years of age. He says that his right shoulder began to fall and that this was accompanied by a feeling of excessive weakness in the left side. About six months after this he began to limp in walking as though he had stubbed his toe. A year later he noticed a feeling of weight in his left side. This gradually grew worse so that when blackening boots he had great difficulty in polishing the left side, and his brush would continually fall from his left hand. This continued for about five years. During this time he was compelled to use a cane. His right hand did not seem to be affected at this time. About four years ago he noticed a tendency to flexion of the fingers of the left hand,—a claw-like contraction,—*main-en-griffe*.

Two years later the right hand became similarly effected. He has never had any pain in his lower limbs.

Sensory disturbances began three years ago.

FIG. 28.



S. P.—The patient is a well-nourished, rather intelligent, light-colored negro. As seen in the accompanying photograph, taken at the Philadelphia Hospital, and furnished together with the following notes through the kindness of Dr. Dercum, he sits in a rolling chair during the day, since he is unable to walk or to move his arms. He has very limited motion of the fingers, particularly those of the left hand. The fingers of both hands are strongly contracted, as seen in the photograph, presenting the typical contracture of *main-en-griffe*. There is atrophy of both upper extremities, but more on the left side. The extensors of the forearm are wasted more than the flexors. The thenar and hypothenar eminences and the interossei muscles are markedly atrophied. The man is quite helpless and is unable to move from side to side when placed on his back. There is an aggravated scoliosis with convexity to the left. The tongue is protruded straight, but shows a slight atrophy to the right side with fibrillary twitching. He is unable to swallow perfectly, and has more difficulty with solid food.

Reflexes.	Right.	Left.
Plantar.....	Present.	
Ankle-clonus	+	0
Knee-jerk	+	0
Cremasteric	Present.	Slight.
Muscle-jerk	+	
Epigastric	0	
Abdominal	0	
Contralateral reflex of adductors....	Present.	

Eye examination, January 23, 1895. Pupils normal; no paralysis of external ocular muscles; fundus normal; optic disks normal.

The sensory changes are well seen in the accompanying charts.

There is partial analgesia over the entire surface of the body, excepting in the posterior aspect of the left forearm, and in a smaller area in the right lumbar region, limited by the lumbar spine, the tenth rib, and the right iliac crest. In these regions the pain sense is normal. Analgesia is complete in the right hand and wrist, posterior aspect of the left hand and left arm and right leg, and in the anterior aspect of the left lower extremity. (See Fig. 29.)

There is total thermo-anæsthesia in the right arm and hand and right side of the posterior thorax, in the left neck and shoulder posteriorly, and over the right anterior side of the waist nearly to the middle line. It will be noticed that this area is not quite superimposed upon an area of analgesia at about the same situation. Over the anterior surface of the left forearm there is confusion of the thermic sense (represented by small circles in the figures), heat being designated cold, and cold, heat.

CASE II.—Joseph Shiselbaer, aged fifty-two, German tailor.

Father died at sixty-five years of a paralytic stroke. Mother died of senility at sixty-seven. Drinks a little; syphilis denied. In the summer of 1890 lost his appetite, became costive, and felt unwell. In December, 1891, he gradually lost feeling in the right hand and arm and could not do his work. He never lost power. Later he lost power of feeling in the left hand. Sensation of pins and needles in both hands and arms, also in the legs. Arms and legs also cold. He never had severe pain. Since December, 1891, was burned many times on the hands and arms without feeling it. Is very emotional.

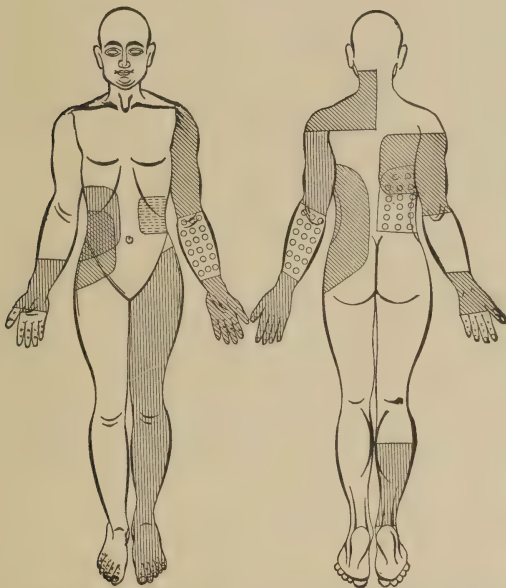
S. P.—A well-built man. No atrophy. Pain on pressure in both axillæ. No pain over the median or ulnar nerves. Spine straight; no pain on flexion of spine or on pressure. Scars from burns on index finger and thumb of the right hand. The right metacarpo-phalangeal joint of the thumb is enlarged and not painful.

Reflexes.—Elbow-jerk gone on both sides. Knee-jerk. No true clonus.

Eyes.—Pupils equal; small, react to light and accommodation. No change in form fields.

Dynamometer: Right 76; left 100.

FIG. 29.



Sensory changes in Case I., Robert Collins.—Thermo-anæsthesia, oblique lines; confusion of sensation, circles; analgesia, vertical lines.

No palsy in arms. Some trouble in touching the fingers and nose. Fibrillary twitchings of muscles of right forearm. Heat and cold sense on the right side not distinguished on the tips of the fingers, but he can distinguish at base of fingers on the palmar aspect.

The patient distinguished heat and cold well on the anterior surface of the arm, not so well on the posterior surface. Left hand same as right. At the base of the fingers feels heat only. In the anterior aspect of the fingers can recognize both heat and cold. Thermo-anæsthesia. In little finger (dorsal surface of left side) hot is called cold. Cold always felt and judged correctly, even in anæsthetic areas.

Confusion of sensation of heat and cold on palmar surfaces of both hands. Hot invariably called cold on the palmar surface of the left hand, and sometimes called warm and sometimes cold on the right side. Hot is called cold on right side over the areas of anæsthesia; not so on the left side. Can distinguish between hot and cold test-tube if time be given and the difference great. Almost always answers correctly as to cold; often does not feel heat at all, and sometimes calls heat cold, but never cold heat. Heat and cold sense normal on other parts of the body.

Tactile sense on right arm diminished on the back of the arm and radial region of the forearm, lost on the back of the hand and tips of the fingers.

On left arm can distinguish between sharp and dull points except on back of hand and first two fingers.

Tactile sense normal on the left little finger.

Sensation to pain diminished in proportion to the area of tactile anæsthesia. The position of the arm is noted well. Muscular sense normal.

BIBLIOGRAPHY.

1. ABBE, ROBERT, AND COLEY, W. B.—Syringomyelia; Operation, Exploration of the Cord; Withdrawal of Fluid, *Journ. Nerv. and Ment. Dis.*, 1892, p. 512.
2. ACHARD, CH.—Syringomyélie avec Amyotrophie du Type Aran-Duchenne et Anesthésie dissociée en Band Zosterioïde, *Gaz. hebdom.*, April 16, 1896.
—Syringomyélie, Type Morvan, *Gas. des Hôpit.*, 1891, No. 82.
ACHARD, CH., AND JOFFROY. See JOFFROY.
3. ADLER.—*Deutsche med. Woch.*, 1893, No. 18, p. 432.
4. AGOSTINI, CESARE.—*Rivista sperimentale di Freniatria*, 1894, Fasc. i.
5. ALELEKOFF, A. N.—Typic and Atypic Forms of Syringomyelia, *Med. Obozr.*, Moscow, 1894, xli. 553-566.
6. VON AMMON.—Die angeborenen-chirurgischen Krankheiten des Menschen, Berlin, 1842, Tafel xii., Fig. 13.
7. ANDRAL.—*Journal de Physiol. expér.* (Obs. 124), Paris, 1826.
8. ANDRESEN, F. C.—Thesis of Kiel, 1869. (Hydromyelia.)
9. ANFIMOFF.—Syringomyélie, Type Morvan, *Vestnik Klin. i Sudibnoi psichiat i nevropatologii*, St. Petersburg, 1891, ix., Part I., 289.
10. ARCHANGELI.—Presentazione di un Malato di Syringomyelia, *Bull. de Soc. Lancisiana d. Osp. di Roma*, 1891.
11. ARNDT.—*Münchener med. Woch.*, 1892; *di Roma*, 1891, 308-324.
12. ASCH.—*Neurolog. Centralbl.*, 1894, p. 320. (Discussion with Kupferberg.)
13. ASMUS, E.—Syringomyelia, *Bibliotheca Med.*, Heft 1, Cassel, 1893.
14. AUBERT UND KAMMLER.—*Moleschott's Untersuchungen*, v. p. 145, 1859.
15. AUFRECHT.—Syringomyelia, *Path. Mitt.*, Magdeburg, 1881, 184-187.
16. BAISTROCCHI.—*Rivista sperimentale di Freniatria*, 1882, Fasc. iii. p. 332.
17. BAKER.—A Case of Chronic Anterior Poliomyelitis with well-marked Cutaneous Anæsthesia and Analgesia, *Brit. Med. Journ.*, Feb. 4, 1893.
18. BALMER.—Haut Störungen bei Progressiver Muskel Atrophie, *Archiv für Heilk.*, 1875.
19. BAMBERGER.—*Wien. med. Presse*, 1869, No. 28, p. 650.
20. BARBIER, C.—Sur un Cas de Syringomyélie, *Provence Méd.*, Lyon, 1889, iii. 376-379.
21. BAUHINUS, CASPAR.—Theatrum Anatomicum, Francfort, 1621, lib. iii. p. 328.
22. BAÜMLER, ANNA.—Thèse de Zürich, 1887.
—Hohlenbildungen im Rückenmark, *Deutsch. Archiv für klin. Med.*, xl., 1887.
—Kranken Vorstellung; Süd-West Deutsch. Neurolog., etc., *Neurolog. Centralbl.*, 1890.
23. BAWLI, JACOB.—Syringomyelia and Trauma, Königsberg, 1896.
24. BECKER.—Syringomyélie, *Arch. f. Psychiatrie*, Berl., 1894, xxvi. 601.
25. BEEVOR.—Tumors of the Spinal Cord simulating Syringomyelia, *Lancet*, Nov. 18, 1893, p. 1252, also Dec. 2, 1893.
26. THE CLINICAL SOCIETY'S TRANSACTIONS, London, 1894.
27. BENEDIKT.—Bemerkungen zur Demonstration von Weiss, *Wiener med. Doctoren Collegium*, 1893.
28. BERBEZ, P.—Essai du Diagnostic d'une Affection indépendante du Tabes avec Arthropathie du Coude gauche, *France Méd.*, 1885, No. 97.
29. BERBEZ.—De la Syringomyélie, *Gaz. hebdom. de Méd. et de Chir.*, Paris, 1889, xxvi., 24 C.
30. BERKLEY, H. J.—*Brain*, London, 1889-90, xii. p. 460.
31. BERNHARDT.—Beitrag zur Lehre der sogenannten partiellen Empfindungs Lähmung, *Berliner klin. Woch.*, No. 4, 1884. (Bruhl, Obs. 23.)
—*Deutsch. Archiv für klin. Med.*, vol. xix.
—Contribution to the Study of Partial Paralysis of Sensibility (Central Glioma of the Cord), *Centralbl. f. Nervenheilkunde*, 1887. (Vide Bruhl, Obs. 21 and 22.)
—Syringomyelia and Scoliosis, *Centralbl. f. Nervenheilkunde*, No. 2, 1889.
—Ueber die sogenannte Morvan'sche Krankheit, *Deutsche med. Woch.*, 1891, 19 Feb., p. 285.
—Litterarisch-historischer Beitrag zur Lehre von der Syringomyelia, *Deutsch. med. Woch.*
32. BERNSTEIN, S.—O Syringomyelia Medycyna, Warszawa, 1892, xx. 167.
33. BICKELES.—Traumatic Hæmatomyelia or Syringomyelia, *Wiener med. Klub*, 8 Nov., 1893.
—*Wiener med. Woch.*, 1893, p. 1852.

34. BIERNACKI, E.—Syringomyelic Dissociation of Sensibility, *Gaz. lekarska*, Warsaw, 1892, 2 S., xiii. 956–963.
—*Neurolog. Centralbl.*, 1893, p. 369.
35. BJORNSTROM.—Algesimetrie, Upsala, 1887.
36. BLOCQ, PAUL.—Demonstration of Syphilitic Arthropathy, *Société d'Anatomie*, 1887.
—*Brain*, 1890, Part III.
—*Gazette des Hôpitaux*, Dec., 1889, No. 140.
—*Nouvelle Iconographie de la Salpêtrière*, 1889.
Études sur les Maladies nerveuses, Paris, 1894.
37. BONETI.—Sepulchretum, Edit. II., Geneva, 1700, lib. i. p. 394.
38. BOOTH.—A Case of Progressive Muscular Atrophy with Anæsthesia, *Medical Record*, N. Y., 1888.
39. BRAMWELL, BYROM.—Diseases of the Spinal Cord, Lectures 23 and 24, 1895.
40. BOUCHAUD.—Syringomyélie à forme de Sclérose latérale amyotrophique et Syringomyélie compliquée d'anæsthésie et de perte du sens musculaire, *Echo Médicale*, Toulouse, 1890.
41. BRIANCEAU, J.—Contribution à l'Étude du Champ visuel dans la Syringomyélie et la Maladie de Morvan, Thèse de Paris, 1891.
42. BRISSAUD, E.—Treatise on Diseases of the Nervous System, Paris, 1895.
—*Presse médicale*, July, 1894.
—*Rev. neurologique*, Paris, Oct. 15, 1894.
—*Comptes-Rendus hebdomadaire des Séances de la Société de Biologie*, March 15, 1895.
43. BROCA.—Trophic Scolioses, *Gazette hebdomadaire de Méd. et de Chirurg.*, No. 39, 1888.
44. BRUCE, ALEXANDER.—Syringomyelia in a Child, *Lancet*, June 16, 1894.
45. BRUHL, I.—Contribution à l'Étude de la Syringomyélie, Paris, 1890.
—*Manuel de Médecine*, Achard et Debove. Article on Syringomyelia.
—De la Syringomyélie, *Archives gén. de Médecine*, July, Aug., 1889.
—La Médecine moderne, Aug. 30, 1893.
46. BRUNELLE.—Syringomyélie: Hæmarthroses, *Bull. Méd du Nord*, Lille, 1892, xxxi. 254, 279.
47. BRUNNER.—Misc. Nat. curios., 1688.
48. BRUNS.—Reference to Charcot's Article on Syringomyelic Arthropathy, *Schmidt's Jahrbücher*, 1894.
—*Rückenmark's Tumor*, *Neurologische Centralblatt*, 1894, No. 7.
49. BRUNSLow.—Ueber einige seltene Falle, etc. (Gliosis Spinalis), Berlin, Dissert., 1890.
50. BRUTTAN, C.—Casuistik der Syringomyelia, Dorpat, 1892.
—*Gesammte Abhandlungen aus der med. Klinik in Dorpat*, 1893.
51. BULL, EDWARD.—Glioma of the Cord, *Schmidt's Jahrbücher*, Bd. exciii.
52. BULLIER.—*Journ. de Phys. expér.*, Paris, 1823, Obs. 121.
53. BUTZ, R. V.—Chir. vestnik, St. Petersburg, 1891, vii. 508.
54. BOCHROCH, M. H.—*Medical News*, Philadelphia, April 20, 1895.
55. CACCIOLA, SALVATORE.—Pathological Histology of Syringomyelia, *Bollotino della Reale accademia Medica di Roma*, t. x., 1887–1888.
56. CAGNEY, JAMES.—Syringomyelia and Morvan's Disease, *Brain*, 1891, p. 368.
57. CAILLET, FREDERIC.—Étude sur les Troubles de la Sensibilité dans les Affections nerveuses (Dissociation syringomyélique), Thèse de Paris, 1891.
58. CALMEIL.—Anatomie et Physiologie de la Moelle épinière, *Journ. de Progrès des Sciences et de l'Institut. méd.*, t. xi. p. 77, Paris, 1828.
—*Ibid.*, 1827, p. 81.
59. DU CASTEL.—*Annales de Dermatologie*, v. 4, April and May.
60. CHABANNE.—Contribution à l'Étude de Hemiatrophie de la Langue, Thèse de Bordeaux, 1892, Obs. 14 and 15.
61. CHARCOT, J. B.—*Revue neurologique*, May 15, 1894.
—De la Dissociation dite syringomyélique dans les Compressions et Sections des Troncs nerveux, *Mode de Retour des Sensibilités après Opérations*. *Compt.-Rend.*, Soc. de Biol., Paris, 1892, iv. 941–45.
62. CHARCOT, J. M.—Leçons sur les Maladies du Système nerveux, vol. ii., Paris, 1887.
—*Maladie de Morvan*, *Semaine Méd.*, ii., Dec., 1889.
—Un Cas de Pseudo-Syringomyélie, *La Semaine Médicale*, 1891, p. 24.
—Leçons du Mardi, t. ii., 1888–89, 21 St. L.
—*Clinique des Maladies du Système nerveux*, t. i., 1892.

- CHARCOT, J. M.—Leçons du Mardi, 1890, p. 488.
 —De la Syringomyélie, *Bulletin Médicale*, 28 Juin, 1889.
 —Arthropathies syringomyéliques, *Prog. méd.*, Paris, 1893, 2 S., xvii. 321-325.
 —De la Maladie de Morvan, *Progrès médicale*, Dec. 11, 1889.
 —*Bull. Méd.*, Paris, 1889, iii. 787.
 —*Echo Méd.*, Toulouse, 1890, 2 S., iv. 193, 205.
 —*Gaz. hebdom. de Méd.*, Paris, 1891, 2 S., xxviii. 172.
63. CHARCOT, J. M., AND BRISSAUD.—Sur un Cas de Syringomyélie observé en 1875 et 1890, *Progrès médicale*, 24 Janvier, 1891, No. 4.
64. CHARCOT AND JOFFROY.—Two Cases of Progressive Muscular Atrophy, *Arch. de Physiologie*, 1870, t. iii. p. 306.
65. CHARCOT ET BRISSAUD.—Sur un Cas de Syringomyélie, observé en 1875 et 1890, *Progrès médical*, 1891, vol. xxii.
66. CHARCOT ET HALLION.—Sur un Cas de Paralysie radriculaire de la première Paire dorsale avec Lésion hemilaterale de la Moelle d'origine traumatique simulant la Syringomyélie, *Arch. de Neurol.*, 1891, vol. xxii.
67. CHANTEMESSE.—Société médicale des Hôpitaux de Paris, Discussion on Debove's Case, July 28, 1893.
68. CHAUFFARD.—Soc. méd. des Hôp., Nov. 4, 1892.
69. CHERON, P.—*Union Médicale*, 1889, p. 685.
70. CHIARI, H.—Pathology of Syringomyelia, *Zeitschrift f. Heilkunde*, Prague, August, 1883.
71. CHIPAULT.—Panaris analgésique avec Fracture spontanée; Syringomyélie, *Bulletin de la Soc. anat.*, 1890.
72. CHOLSCHEVNIKOFF.—Case of Peculiar Reproduction of Peripheric Nerve in Degeneration of a Funiculus in Syringomyelia, *Med. pribav k. morsk. sborniku*, St. Petersburg, 1889, 174-194.
73. CHURCH.—Syringomyelia, *Western Medical Reporter*, Chicago, Ill., June, 1889.
74. CLARKE, LOCKHARDT, AND THUDICHUM.—*Beale's Archives*, xiii., Obs. 2, p. 41; *Lancet*, vol. i., 1865, p. 113.
75. CLARKE, L., AND RADCLIFFE.—On the Pathology of Tetanus, *Medico-chirurg. Trans.*, 1865, Case II.
76. CLARKE, LOCKHARDT, AND HUGHLINGS JACKSON.—*Medico-Chirurg. Trans.*, 1867, p. 489.
77. CLARKE.—*Medico-Chirurg. Trans.*, 1868, vol. li.
78. COHEN, S. SOLIS.—Bulbar Paralysis with Disturbance of Sensibility to Pain and Temperature, and other Symptoms of Syringomyelia, *Medical and Surgical Reporter*, July 13, 1889, p. 34.
79. COLEMAN, J. B., AND O'CARROLL, J.—A Case of Syringomyelia, *Lancet*, Aug. 12, 1893, p. 362.
80. COLLEVILLE.—Sur un Cas de Parésie analgésique, *Gaz. hebdom.*, 1887, No. 25.
81. CRITZMAN, E.—Thesis of Paris, 1892.
82. CURSCHMANN.—Klinische Abbildungen, Tafeln 17-23, Berlin, 1894.
83. CZERNY.—Ueber neuropathische Gelenkaffection, *Centralbl. f. Chirurgie*, 1886, No. 24.
84. DANA, C. L.—Case of Gliomatosis of the Spinal Cord (and Syringomyelia) with Recurrent Hemorrhages, *Journ. of Nerv. and Ment. Dis.*, N. Y., 1894, xxi. 567-575 (January and October).
 —*New York Medical Journal*, 1893. Also Text-Book on Nervous Diseases.
85. DAXENBURGER.—Ueber Gliombildung und Syringomyelie, Erlangen Dissert., 1890.
 —Ueber Compression-Myelitis, etc., *Deutsch. Zeitschr. f. Nervenheilk.*, Bd. v.
86. DEBOVE.—A Case of Syringomyelia, *Bull. de la Soc. méd. des Hôpitaux*, Feb. 22, 1889.
 —*Gaz. hebdom.*, 1889, No. 10.
 —Maladie de Morvan ou Lèpre, Soc. méd. des Hôpit. de Paris, July 20, 1893.
87. DÉJÉRINE.—Sur un Cas de Syringomyélie suivi d'Autopsie, *Semaine Méd.*, June 12, 1889.
 —*Bull. de la Soc. méd. des Hôpitaux*, Feb. 22, 1889.
 —*Compt.-Rend. de la Soc. de Biol.*, Paris, 1890.
88. DÉJÉRINE AND A. THUILANT.—Dissociation of Thermic Sensibility in a Case of Syringomyelia, with Autopsy, *La Médecine moderne*, Feb. 5, 1891.
89. DÉJÉRINE.—Rétrécissement du Champ visuel dans la Syringomyélie, Soc. de Biol., July 12, 1890.
90. DÉJÉRINE AND SOTTAS.—Syringomyélie unilatérale, *Le Bulletin médical*, 1892, p. 1102.

91. DÉJERINE ET MIRALLIE.—Hemiatropia de la Face avec Phénomènes oculo-pupillaires dans un Cas de Syringomyélie unilatérale.
—Troubles trophiques et vaso-moteurs dans la Syringomyélie, *Archives de Physiologie*, Oct., 1895.
92. DÉJERINE AND LETULLE.—La Maladie de Friedreich, *La Semaine Méd.*, 1890.
93. DE JONG.—Progressive Bulbar Paralysis in a Case of Syringomyelia, *Freiburger Dissertation*, 1889.
94. DERCUM, F. X.—*International Clinics*, vol. ii., 1892.
—*Journ. Nerv. and Ment. Dis.*, March and April, 1894.
95. DERCUM AND SPILLER.—*Amer. Journ. Med. Sciences*, Dec., 1896.
96. DESNOS AND BABINSKI.—*Bull. et Mém. Soc. méd. des Hôp. de Paris*, 1891, 652-656.
97. DICKINSON.—On the Pathology of Chorea, *Med.-Chirurg. Trans.*, vol. lix. p. 3, 1876.
98. DONATH.—Ueber die Grenzen des Temperatursinnes, etc., *Arch. f. Psych.*, Bd. xv., 1884.
99. DRESCHFELD.—Some Rare Forms of Muscular Atrophy, *Brain*, 1885.
100. DUCHENNE DE BOULOGNE.—De l'Électrisat. localisée, 3d ed., vol. i. p. 453, Paris, 1847.
101. DUESING, HERMANN.—Pathologisch-anatomische Untersuchung eines Falles von Syringomyelie, Würzburg, 1891, Stael, 28 pp.
102. DURING, E.—Lepra und Syringomyelie, *Deutsch. med. Woch.*, 1894, No. 6.
103. DYER, ISIDORE.—Syringomyelia and Lepra Nervorum, *New Orleans Med. and Surg. Journ.*, Aug., 1892.
104. EDGEWORTH.—*Bristol Medico-Chirurgical Journ.*, Jan., 1894.
105. EHLERS.—Lepra und Syringomyelia, *La Semaine Méd.*, 1893, No. 56.
106. EICHHORST AND NAUNYN.—*Arch. f. exper. Path. und Phar.*, t. ii., 1874.
107. EICKHOLT.—Contribution to the Study of Central Sclerosis, *Arch. f. Psychiatrie*, 1880, t. x. p. 613.
108. EISENLOHR.—Zur pathol. Anatomie der syphilitischen Tabes; Syringomyelie, *Arch. f. Psychiatrie*, Bd. xxiii. p. 603.
—*Neurol. Centralbl.*, 1892, p. 453.
—Ein Fall von Morvan'scher Krankheit, *Deutsch. med. Woch.*, 1893.
109. ERB.—Krankheiten des Rückenmarks, Ziemssen's Handbücher, xi.
—*Neurol. Centralbl.*, 1893, No. 6, p. 177.
110. ERBEN.—*Internat. klin. Rundsch.*, May, 1892.
111. ESKRIDGE, J. T.—*International Clinics*, vol. iv., 3d Series, Phila.
—*International Clinics*, vol. iii., 2d Series.
112. EULENBERG, ALBERT.—*Berlin klin. Woch.*, 1869, No. 44; *ibid.*, 1866, No. 46.
—Study of the Methods of Examination of Sensibility, *Zeitschr. f. klin. Med.*, ix.; *Real Encyklopädie*, 1889.
113. EULENBERG.—*Deutsch. med. Woch.*, Dec. 14, 1893.
114. FAMBOURERE, P.—*Archives de Neurologie* (of Moscow), 1893, xxvi. 134.
115. FEDOROFF, M. J.—Un Cas de Syringomyélie, type Morvan, *Yuzh o Russko Med. Gaz.*, Odessa, 1893, pp. 479-493; *Rev. neurologique*, 1893, p. 634.
116. FERRANNINI, ANDREA.—Nucleo nosologico della siringomieliia definito da una sua forma familiare sinora non descritta, *La Riforma medica*, Anno x., Nos. 136-140, 1894.
117. FERRIER, D.—Localization of Atrophic Paralyses, *Brain*, vol. iv., 1881.
118. FISCHER, HEINRICH.—Zur Casuistik und Diagnose der Syringomyelie, *Inaug. Dissert.*, Leipzig, 1894.
—*Zeitschr. f. Chirurg.*, Bd. xii.
119. FRANCOTTE, X.—Formation Gliomateuse d'une Cavité, *Arch. de Neurologie*, 1890, No. 56.
120. FREUND.—A Case of Muscular Atrophy with Disorders of Sensibility, *Wiener med. Woch.*, Nos. 13 and 14, 1885, p. 390. (Bruhl, Obs. 26.)
121. FRIEDMANN.—*Archiv f. Psychiatrie*, xvi., 1885.
122. FRIEDREICH.—*Virchow's Archiv*, Bd. xxvi., 1863, p. 410.
123. FROMMANN.—Untersuch. über norm. u. path. Anat. d. Rückenmarks, I. Theil, Jena, 1864, p. 79.
124. FÜRSTNER AND STUHLINGER.—Ueber Gliose und Hohlenbildung in der Gehirnrinde, *Arch. f. Psychiatrie*, Bd. xvii. p. 1.
125. FÜRSTNER AND ZACHER.—Pathology and Diagnosis of Cavities of the Spinal Cord, *Arch. f. Psychiatrie*, 1883, p. 433, v. xiv. (Bruhl, Obs. 25.)
126. FUNKE.—Ueber eine neue Methode zur Prüfung des Temperatursinnes, *Zeitschr. f. Heilkunde*, Bd. xi., 1890.

127. GALEZOWSKI.—Disturbances of Vision in Syringomyelia, *Rev. d'Ophthalmol.*, Paris, 1893, xv. 546-551.
128. GALLOWAY.—*Brit. Med. Journ.*, 1891, p. 641.
129. GEIMELLI.—Pseudo-Syringomyélie, etc., dans la Paralyse générale (Artefacts), *Rivista sperimentale di Freniatria*, vol. vii., Fasc. 1, 33d yr.
130. GERLACH, WOLD.—Ein Fall von congenitaler Syringomyelie mit intramedullärer Teratombildung, *Deutsches Zeitschr. f. Nervenheilkunde*, 1894, p. 271.
131. GESSLER, H.—Syringomyelia and Morvan's Disease, *Med. Cor. Bl. d. Württemberg. Arztl. Ver.*, Stuttgart, 1893, lxiii. 1-6.
132. GIGNON.—Traité de Médecine, vol. vi., Paris, 1894.
133. GIMENO, A.—Caso notable de Siringomyélie, *Progreso méd.-farm.*, Madrid, 1891, iv. 479.
134. GLASER.—Central Angeiosarcoma of the Cord, *Archiv f. Psychiatrie*, 1885, xvi. p. 85.
135. GOLDSCHIEDER.—Verhandlungen der physiologischen Gesellschaft zu Berlin, séance 14 Mars, 1890.
—*Archiv f. Psychiatrie*, xviii., 1887.
—*Berlin klin. Woch.*, 1892 (Discussion).
—*Arch. v. Dubois-Reymond*, 1885.
136. GOMBAULT.—Lepra et Syringomyélie, *Revue neurologique*, 1892.
—Sur un Cas de Maladie de Morvan, *Gaz. des Hôpit.*, 1889, No. 50.
—*Revue neurologique*, 1893, No. 14.
—Un Cas de Maladie Morvan, suivi d'Autopsie, *Gaz. hebdom.*, 1889, Nos. 19 and 20.
137. GORTZ.—Ueber einen Fall von Syringomyelie, Inaug. Dissert., Greifswald, 1892.
138. GOWERS.—*Clinical Journal*, London, May 31, 1893.
—Diseases of the Nervous System, 1st ed., 1888.
—Clinical Lectures, Philadelphia, 1895 (Lecture xii.).
139. GRAF, E.—*Neurologisches Centralbl.*, 1893, p. 699.
140. GRASSET.—Leçons sur le Syndrome bulbo-médullaire, *Montpellier Méd.*, 1889.
—Un Cas de Maladie de Morvan, Leçons recueillies, Paris, 1892.
141. GRAY, LONDON CARTER.—Treatise on Nervous Disease and Insanity, 2d ed., 1895, Philadelphia, p. 282.
—*Boston Med. and Surg. Journ.*, 1890, p. 570.
142. GRIMM, J.—Muscular Atrophy, *Virchow's Archiv*, 1869, xlviii. 445.
143. GUINON.—Traité de Médecine, Edited by Brissaud, vol. vi., chapter on Syringomyelia, Paris, 1894.
—Nouvelle Iconographie de la Salpêtrière, iii., 1890.
144. GUELLIOT.—Panaris analgésique, *Gaz. hebdom.*, 1886.
145. GULL, SIR WM., AND CLARK.—A Case of Progressive Muscular Atrophy of the Hand, with Dilatation of the Central Canal and Atrophy of the Gray Matter, *Guy's Hospital Reports*, 1862, p. 244.
146. GUNTHER.—The Typical Form of Progressive Muscular Atrophy, *Berlin. klin. Woch.*, 1883.
147. GYURMANN.—A Case of Syringomyelia, *Wiener med. Presse* (Bruhl, Obs. 33), u. *Pesther med. Presse*, 1889.
—A Case of Syringomyelia; Post-mortem Examination, *Ungarisches Archiv für Medizin*, Bd. i. Heft 1, 1892.
—Festschrift an Prof. Koranyi, 1891.
148. HADLICH.—*Neurologisches Centralbl.*, Dec., 1887, p. 558.
149. HALLION, LOUIS.—Thesis of Paris, 1892, *Revue neurologique*, Feb. 28, 1893; *Neurologisches Centralblatt*, No. 4, 1892; *ibid.*, No. 20, 1892.
150. HALLOPEAU, H.—Contribution to the Study of Diffuse Periependymal Sclerosis, *Gaz. méd. de Paris*, No. 1, 1870.
151. HANOT.—Parésie analgésique à Panaris, *Arch. gén. de Méd.*, 1877.
152. HANSEN.—*La Semaine Médicale*, 1893, No. 56, p. 447.
153. HARCKEN, JUSTUS.—Thesis of Kiel, 1883.
154. HARRIS.—Note on a Case of Multiple Tumors of the Cord and of the Brain, with a Contribution to the Pathology of Syringomyelia, *Brain*, 1886, vol. vii. p. 447.
155. HAUMANN, EMIL.—Thesis of Greifswald, 1889.
156. HEBALD, OTTO.—*Arch. f. Psychiatrie*, Bd. x.
157. HEGEMANN, PAUL.—Thesis of Bonn, 1889, Case III.
158. HELLICK.—Contributions to the Etiology of Syringomyelia, *Sborn. lek. v. Prage*, 1890, iii. 487-550.
159. HERING.—Temperatursinn, Hermann's Handbuch der Physiologie.

160. HEROLD.—Glioma of the Cord, *Arch. f. Psychiatrie*, xv., 1884.
161. HERTZEN.—On the Separation of the Thermic Sense into Two Distinct Senses, *Pflüger's Arch.*, xxxviii.
162. HINSDALE, GUY.—INTERNATIONAL MEDICAL MAGAZINE, Nov. and Dec., 1896, Jan., 1897.
163. HITZIG.—*Arch. f. Psychiatrie*, xvi., 1885, p. 566.
—Hematorrhachis Syringomyelia, etc., *Allg. Zeitschrift f. Psychiatrie*, Berlin, 1885, p. 702.
164. HOCHENEGG-PALTAUF.—Ueber symmetrische Gangrän, *Wiener med. Jahrbücher*, 1885.
165. HOCHHAUS, H.—Zur Kenntniss des Rückenmarks Gliom, *Deutsches Archiv f. klin. Med.*, Bd. xlvii. p. 603.
166. HOFFMANN, JOHANN.—*Neurol. Centralbl.*, 1889, No. 19.
—Sammlung klin. Vort. von Volkmann, 1891, No. 20.
—*Deutsches Zeitschr. f. Nervenheilkunde*, Bd. iii., 1892.
167. HOLSCHERNIKOFF.—A Case of Syringomyelia with Degeneration of the Peripheral Nerves and Trophic Changes (Acromegaly), *Virchow's Archives*, No. 119, 1885.
168. HOMEN, E. A.—Bidrag till kennedoms zur Syringomyelin, *Nord. Med. Archiv*, vol. xxvi., No. 1, 1894.
169. HUCKEL.—*Münchener med. Woch.*, Nos. 27 and 28, 1889.
170. HUTIN.—*Nowv. Bibliothèque méd.*, t. i. p. 159, Paris, 1828.
171. HOLT, L. EMMET, AND C. A. HERTER.—Acute Gliomatosis, *Amer. Journ. Med. Sci.*, April, 1895.
172. HUBLER, W.—Inaug. Dissert., Würzburg, 1894.
173. JACKSON, HUGHLINGS, AND GALLOWAY.—*Lancet*, 1892.
174. JACQUET.—Soc. de Biologie, 1890.
175. JACQUET ET SAINT-GERMAIN.—Lésions cavitaires de la Moelle dans un Cas de Sclérodémie, Soc. française de Derm. et de Syphilogr., April 22, 1892.
—Lésions cavitaires de la Moelle dans un Cas de Sclérodémie, Soc. française de Derm. et de Syphilogr., April 22, 1892.
176. JEFFRIES, JOHN AMORY.—*Journ. Ment. and Nerv. Dis.*, Sept., 1890.
177. JIMENO, A.—Caso notable de Syringomielia, *Corresp. Méd.*, Madrid, 1894, xxix. 228-230.
178. JOFFROY AND ACHARD.—Myelitis with Cavities, *Arch. de Physiologie*, 1887.
179. JOFFROY.—Syringomyélie non-gliomateuse associée à la Maladie de Basedow, *Archives de Méd. expér. et d'Anatomie pathologique*, 1891, p. 90.
180. JOFFROY, A., ET ACHARD, CH.—Syringomyélie non-gliomateuse associée à la Maladie de Basedow, *Neurol. Centralbl.*, 1894.
—Nouvelle Autopsie de Maladie de Morvan, Syringomyélie, *Archives de Méd. expér. et d'Anatomie pathologique*, 1891, p. 677.
—Inflammation de l'Épendyme de la Moelle épinière, *ibid.*, Jan., 1895.
—*Ibid.*, 1890, p. 540.
181. JOFFROY, A.—Bull. et Mém. de la Soc. des Hôp., 1891, p. 92; and 1889.
182. JOLLY, F.—Ueber trophische Störungen bei Rückenmarks Erkrankungen, *Charité-Annalen*, Berlin, 1891, 336-349; also *Archiv f. Psychiatrie*, Berlin, 1891, 585.
183. *Journ. de Médecine de Bruxelles*, 1893, No. 22 (Review).
184. JUMAN.—*La France Médicale*, Paris, 1890.
185. KAHLER, M.—Cervical Paraplegia with Unusual Disturbances of Sensibility, *Prager med. Woch.*, x. 18, 1882. (*Vide Bruhl*).
—The Diagnosis of Syringomyelia, *Prager med. Woch.*, No. 6, 1888. (*Vide Bruhl*).
—Two Cases of Syringomyelia, *La Semaine Médicale*, 1888, p. 83.
186. KAHLER AND PICK.—Contribution to the Study of Syringomyelia and Hydro-myelia, *Prager Vierteljahrsschrift*, cxlii., 1879.
—*Arch. f. Psychiatrie*, x., 1880.
—Beitrag zur Pathologie und pathologischer Anatomie des central Nerven-systems, Leipzig, 1879.
187. KANASUGI, H.—Casuistische Beiträge zur Kenntniss der Syringomyelie, *Erlanger Dissert.*, 1890.
188. KARG.—Zwei Fälle von ausgedehnten neuropathischen Knochen und Gelenkerstörungen, *Arch. f. klin. Med.*, Bd. xli. p. 101.
189. KESTEREN.—Pathological Histology of the Cord, *St. Bartholomew's Hosp. Repts.*, 1872.
190. KETHI.—*Wiener med. Woch.*, 1890, No. 26.

191. KIEWLICZ, MARIAN.—*Deutsches Arch. f. Psychiatrie*, xx., 1888.
192. KLEBS, E.—Glioma of the Spinal Cord, *Prager Vierteljahrschrift*, cxxxiii., 1877, Obs. 1, p. 74.
193. KLEMM.—Arthritis deformans bei Tabes und Syringomyelie, *Deutsch. Zeitschrift f. Chirurgie*, Bd. xxxix.
194. KLIPPEL.—Les Lésions de la Moelle dans la Scoliose de l'Enfance, *Gaz. hebdom.*, 1891, No. 13.
195. KNOPPEK.—Beitrag zur Diagnostik der Syringomyelie, *Wiener med. Presse*, 1892, No. 3, or *Wiener med. Woch.*, 1892.
196. KOBERLIN.—Hohlenbildung im Rückenmark, *Münch. med. Woch.*, 1889, No. 19.
197. KÖHLER, HERMANN.—Meningitis Spinalis, Leipzig, 1861, p. 105.
198. KOPPEN.—Acute Cavity Formation in the Spinal Cord, *Neurologisches Centralblatt*, 1892, p. 487.
199. KORB.—Syringomyelia and Degeneration of the Posterior and Lateral Columns; Autopsy, *Deutsch. Zeit. f. Nervenheilk.*, Bd. viii., 1896, p. 359.
200. KORNFELD.—Tabes with Symmetrical Gangrene and Symptoms of Syringomyelia, *Wiener med. Woch.*, Nov. 5, 1892.
201. KORNILOW.—*Neurol. Centralbl.*, 1892, p. 493.
202. KRAFFT-EBING.—*Allg. Wiener med. Zeitung*, 1892, No. 48.
203. KRAUSS, E.—A Case of Syringomyelia, *Virchow's Archives*, Bd. c., 1885.
204. KRAUSS, W. C.—*Journ. Nerv. and Ment. Dis.*, Nov., 1892, p. 304.
205. KRETZ, R.—*La Semaine Méd.*, Feb., 1890; *Wien. klin. Woch.*, 1890, pp. 479–500.
206. KRONIG.—*Zeitschr. f. klin. Med.*, Bd. xiv.
207. KRONTHAL.—Contribution to the Study of the Pathology of Cavities in the Spinal Cord, *Neurologisches Centralbl.*, Nos. 20–22, 1889.
208. KUPFERBERG, HEINZ.—Ein unter dem Bilde eines Gehirntumors verlaufender Fall von chronischen idiopathischen Hydrocephalus internus, complicirt mit symptomloser Syringomyelie, *Deutsch. Zeitschr. f. Nervenheilkunde*, 1893, p. 94.
209. LACHMANN.—Gliom im obersten Theile des Filum terminale, *Arch. f. Psychiatrie*, Bd. xiii.
210. LAMACQ.—*Journ. de Méd. de Bordeaux*, 1889–90, xix. 361.
211. LANCEREAUX.—A Case of Hypertrophy of the Spinal Ependyma with Obliteration of the Central Canal of the Cord, *Bull. de la Soc. de Biologie*, t. iii. p. 224, 1862.
212. LANDOIS AND MOSLER.—Study of the Dissociated Troubles of Sensibility, *Berliner klin. Woch.*, 1868. (Bruhl, Obs. 36.)
213. LANGHANS, TH.—On the Formation of Cavities in the Cord following Hemorrhage, *Virchow's Archives*, Bd. lxxxv., 1881.
—Zur Casuistik der Rückenmarksaffection (Tetanie und Lepra anæsthetica), *Virchow's Archives*, 1875, p. 175.
214. LASSALA, A.—*Crón. méd.*, Valencia, 1892, pp. 353–358.
215. LEEGAARD, C.—Gliomatosis; Syringomyelia seated in the Posterior Horns, *Norsk. Mag. f. Laege-vidensk.*, Christiania, 1890, v. 69–84.
—Method of Examining Sensation of Temperature, *Deutsch. Archiv f. klin. Med.*, 1891, Bd. xlviii. 3. und 4. Heft, p. 207.
216. LEFORT.—Panaris analgésique, *Mercure Médical*, Dec. 30, 1890, p. 651.
217. LEMOINE.—On Syringomyelia, *Gaz. méd. de Paris*, 12–14, 1889.
218. LENHOSSÉK.—*Oesterr. Zeitschr. f. prakt. Heilk.*, Jahr V., Vienna, 1859, pp. 62–63.
219. LENZ, G.—Thesis of Freiburg, 1892.
220. LEPINE.—Syringomyelia, *Lyon Médical*, 1892, lxxi. 481.
221. LEUBE.—Methods for Examining Sensibility, *Centralbl. f. die med. Wissenschaft.*, 1876.
222. LEVI ET SAUVINEAU.—Syringomyelia with Reflex Iridoplegia, *Le Mercredi Méd.*, 1895, No. 15, p. 173.
223. LEYDEN.—Hydromyelus and Syringomyelia, *Virchow's Archives*, Bd. lxxviii., 1876, pp. 1–11.
—Klinik der Rückenmarks-Krankheiten, vol. ii., 1875, pp. 452–454.
224. LLOYD, JAS. HENDRIE.—Arthropathy, etc., *Philadelphia Hospital Reports*, 1892.
—Trans. Coll. Phys., Phila., 1893, *Univ. Med. Mag.*, March, 1893.
—Traumatic Affections of the Spinal Cord Simulating Syringomyelia, *Journ. Nerv. and Ment. Dis.*, June, 1894.
225. LOOFT.—Lepra besondere Rückenmarks, *Virchow's Archiv*, Bd. cxxviii.
226. LOUBOVITCH, J.—*Mémoires Médicaux*, Moscow, 1894, Nos. 1 and 2.
227. LUNN, J. R., AND BEEVOR.—*Lancet*, May 19, 1894.

228. LUXENBURG, J.—A Case of Hydro-Syringomyelia, *Gazeta lekarska*, 1894, No. 13.
229. LORENTI.—*Riforma Medica*, 1894.
230. LONDE AND PERRY.—Nouvelle Iconographie de la Salpêtrière, July to Oct., 1894.
231. MCCONNELL, J. W.—Two Cases of Syringomyelia: One of Unilateral Type, *Journ. Nerv. and Ment. Dis.*, April, 1894.
232. MADER.—Hydromyelia generalized throughout the Cord, *Wiener Med. Blatt.*, 1885.
233. MAGELHAES.—Lepra e siringomielia, *Gaz. Med. da Bahia*, Maio, 1894, No. 14.
234. MANN, LUDWIG.—Zwei Fälle von Syringomyelie nebst Bemerkungen über das Vorkommen des tabischen Symptom-Complexes bei derselben, *Deutsch. Arch. f. klin. Med.*, 1892.
235. MARESTANG.—Contribution à l'Étude du Diagnostic différentiel de la Lèpre anæsthésique et de la Syringomyélie, *Revue de Méd.*, Paris, 1891, xi. 781.
—*Ann. de Der. et de Syphilogr.*, 1892, p. 407.
236. MARIE.—Un Cas de Syringomyélie à Forme pseudo-acromégallique (Cheiro-mégallie), *La Semaine Médicale*, 1894, Nos. 22 and 23.
237. MARINESCO, G.—Contribution à la Pathologie des Arthropathies neuro-spinales, *Revue neurologique*, July 30, 1894.
—*Archives de Physiologie*, July, 1893, No. 3.
238. MARTIN.—Transactions of the Eleventh International Medical Congress, Rome, 1894.
239. MARWEDEL, G.—*München. med. Woch.*, 1890, xxxvii. 810.
240. MASIUS.—Un Cas de Syringomyélie, Lüttich, 1890.
241. MENNICKE, O.—Ueber Syringomyelie mit anatomischer Untersuchung, zweite Fälle, Marburger Dissert., 1891.
242. MEYER, LUDWIG.—*Virchow's Archives*, Bd. xxvii., 1863, p. 414.
—*Canadian Practitioner*, July 16, 1892.
243. MEYERS, D. C.—*Canadian Practitioner*, 1892, p. 321.
244. MILLS, CHAS. K.—*Journ. Nerv. and Ment. Dis.*, April and June, 1894.
245. MINOR.—*Arch. f. Psychiatrie*, vol. xxiv.
—Contribution à l'Étude d'Hématomyélie et de la Syringomyélie, Congrès de Berlin, Aug., 1890, and *Semaine Médicale*, Aug. 6, 1890.
—*Neurol. Centralbl.*, 1890, No. 16.
—*Neurol. Centralbl.*, 1894.
246. MIURA, KIUNOSUKE.—The Origin of Cavities in the Cord, *Virchow's Archives*, Bd. cxvii., 1889.
247. Ueber Gliom des Rückenmarks und Syringomyelie, *Neurol. Centralbl.*, 1892, No. 4.
248. MONOD ET REBOUL.—Contribution à l'Étude de Panaris analgésique (Maladie de Morvan), *Archiv. gén. de Méd.*, 1888, p. 28.
249. MOORE.—Dilatation of the Central Canal of the Cord, *Trans. Path. Soc.*, London, Oct., 1880.
250. MORGAGNI AND SANTORINI.—Leyden, 1740, *Animadvers.* xiv., pp. 17–18.
251. MORVAN.—*Gaz. hebdom. de Méd. et de Chirurg.*, 1883, No. 35; 1886, No. 32; 1887, p. 549.
—De l'Anæsthésie sous les divers Modes, etc.; Cas frustes de Paréso-analgésie, *ibid.*, 1889, Nos. 35 and 36.
252. MÜLLER, HERMANN F.—*Deutsches Arch. f. klin. Med.*, 1894, vol. lii. p. 259.
—*Internat. klin. Rundschau*, 1893.
253. MÜLLER, FRIEDRICH.—Ein Fall von Syringomyelie, *Berlin. klin. Woch.*, 1894, No. 12.
254. MÜLLER, FR., UND MEDER.—*Zeitschrift f. klin. Med.*, 1895, Bd. xxviii. p. 47.
255. MÜLLER, CARL.—Ein Fall von Morvan'sche Krankheit, *Deutsch. Med. Woch.*, 1895, No. 13.
256. NAUNYN.—*Centralbl. f. d. med. Wiss.*, 1894, No. 6.
257. NEUBERGER.—*Wiener med. Presse*, 1894, No. 12, p. 445.
258. NEUHAUS, HUGO.—Thesis of Berlin, 1889.
259. NEWMARK, LEO.—*Medical News*, July 22, 1893, p. 88.
260. NISSEN, F.—Syringomyelic Arthropathy, *Arch. f. klin. Chirurg.*, Berlin, 1892–93, xlv. 204–220.
261. NONAT.—Researches on the Development of an Accidental Canal in the Spinal Cord, *Arch. gén. de Méd.*, 1888, p. 287.
262. NONNE, M.—A Case of Typical Tabes Dorsalis and Central Glioma in a Syphilitic, *Arch. f. Psychiatrie*, Berlin, 1892, xxiv. 526–533; *Neurol. Centralbl.*, 1892, p. 453.

263. O'CONNOR.—A Case of Syringomyelia with Symptoms of Neuritis of the Left Brachial Plexus, *Hahnemannian Medical Monthly*, Philadelphia, 1890.
264. OLLIVIER.—Traité de la Moelle épinière et de ses Maladies, 1823.
265. OPPENHEIM, H.—*Charité-Annalen*, 1885, p. 409.
—A Case of Syringomyelia, *Neurol. Centralbl.*, 1884. (Bruhl, Obs. 27.)
—*Arch. f. Psychiatrie*, xv.
—*Arch. f. Psychiatrie*, xxv., 1893, p. 315.
266. OSLER.—Glioma of the Spinal Cord, *Journ. Nerv. and Ment. Dis.*, 1888.
267. ORMEROD, J. A.—A Case of Spinal Disease, Probably Syringomyelia, *Trans. Med. Soc., London*, 1891, xv. 452.
268. PAGENSTECHER.—Syringomyelie, Spina Bifida, angeboren Hydromyelus, *Zeitschr. f. klin. Med.*, Bd. xxii.
269. PELLIZI.—A Case of Pellagra with Syringomyelia, *Rivista sperimentale di Freniatria e di Med. legale*, t. xviii. f. iii. et iv.
270. PARMENTIER.—Nouvelle Iconographie de la Salpêtrière, 1890, p. 213.
271. PENNATO, P.—Syringomyelia e Tumori Spinali, *Riv. renata di Sc. med.*, Venezia, 1894, xx. 485.
272. PERVES.—Contribution à l'Étude comparée de la Syringomyélie et la Maladie de Morvan, Bordeaux Thesis, 1891.
273. PREOBRAJENSKI, P. A.—Un Cas de Syringomyélie non-gliomateuse, *Mémoires médicaux*, Nos. 12 and 14, 1894.
274. PERREY.—Arthropathies of Syringomyelia, Paris Thesis, 1894.
275. PETERSON, FREDERICK.—Acromegaly combined with Syringomyelia, *Medical Record*, New York, Sept. 23, 1893.
276. PFEIFFER.—Ein Fall von ausgebreitetem ependymaren Gliom der Gehirnhohlen, *Deutsches Zeitschr. f. Nervenheilk.*, 1894, p. 459.
277. PICCOLHUOMINI.—Anatomical prælectiones, Rome, 1856, p. 260.
278. PICK.—*Arch. f. Psychiatrie*, viii. 285, 1878; *Wiener med. Woch.*, 1888.
279. PINGEN, K.—Zur Casuistik zur Syringomyelie, Seven Cases, Three with Autopsy, Inaug. Dissert., Cologne, 1894.
280. PITRES AND SABRAZES.—Bacteriological Examination of the Spinal Cord and Nerves in Syringomyelia, *Arch. klin. de Bordeaux*, May, 1893.
—Systematic Nervous Leprosy, Syringomyelic Type, Nouvelle Iconographie de la Salpêtrière, No. 3, 1892.
281. PORTAL.—Mém. sur la Nature et le Traitement de plusieurs Maladies, Paris, 1800, vol. i. p. 53.
282. PORTAL ET SENAC.—Cours d'Anatom. méd., t. iv. p. 117, Paris, 1804.
283. POSPELOW.—Lepra und Syringomyelie, *Monats. f. prakt. Derm.*, Bd. xv. 1892, p. 81.
284. PRENANT.—Sur le Canal épendymaire primitif, *Intern. Monatschr. f. Anat. und Phys.*, 1894.
285. PRINCE, MORTON.—Article in "Nervous Diseases by American Authors," edited by Dercum, Philadelphia, 1895.
286. PRIEBRAM.—*Prager med. Woch.*, 1891, No. 24.
287. PRUS.—*Przegląd lekarski*, Krakow, Nos. 48-52, 1893.
—Syringomyelie und Morvan'sche Krankheit und Lepra, *Arch. f. Psychiatrie*, 1895, t. xxvii. fasc. iii.
288. RACHETTI.—Della Struttura della Medul. Spinal, Milan, 1816.
289. RAICHLINE, A.—Contribution à l'Étude clinique de la Syringomyélie sur un Cas de Syringomyélie avec Manifestations bulbaires, Paris, 1892.
290. RAICHLINE, A., ET GUINON, GEO.—*Progrès méd.*, 1891, No. 4, p. 83.
291. RANVIER.—On the Neuroglia, *Acad. des Sciences*, June 5, 1882.
292. RAUZIER.—*Nouv. Montpellier Méd.*, 1893, t. ii.
293. RAYMOND.—Note on a Case of Hydromyelia, *Arch. de Physiologie*, 1888.
—Anatomie pathologique du Système nerveux.
—Atrophies musculaires et Maladies amyotrophiques, 1889.
—*Archives de Neurologie*, Aug., 1893.
294. REDLICH, EMILE.—Zur pathologischen Anatomie der Syringomyelie und Hydromyelia: aus dem Labor. von Prof. Obersteiner in Wien, *Neurol. Centralbl.*, 1892, No. 4.
295. REISINGER UND MARCHAUD.—*Virchow's Archiv*, Bd. lxxviii., 1884, p. 369.
296. REMAK.—A Case of Syringomyelia, *Deutsch. med. Woch.*, No. 47, 1884. (Bruhl, Obs. 28.)
—*Berliner klin. Woch.*, 1887.
—*Arch. f. Psychiatrie*, vol. ix.

- REMAK.—Œdema of the Superior Members of Spinal Origin, *Berliner klin. Woch.*, No. 3, 1889. (Bruhl, Obs. 24.)
297. RENAULT.—*Arch. de Physiologie*, 1882.
—*Gaz. méd. de Paris*, 1884.
298. RIESINGER.—Glioma of the Cord, *Virchow's Archives*, xcvi., 1884.
299. RIPPING.—*Allgemeine Zeitschrift f. Psychiatrie*, vols. xxx. and xxxii., 1874 and 1875.
300. ROGER.—*Revue de Médecine*, 1892, p. 577.
301. ROSENBAACH.—The Diagnosis of Syringomyelia, *Petersburg med. Woch.*, No. 9, 1887. (Bruhl, Obs. 34.)
—On the Neuropathic Symptoms of Lepa, *Neurol. Centralbl.*, No. 16, 1884.
302. ROSENBAACH UND SCHTSCHERBAK.—Zur Casuistik der Syringomyelie, *Neurol. Centralbl.*, 1890.
303. ROSENBLATH.—*Deutsches Arch. f. klin. Med.*, 1893, Bd. li. p. 210.
304. ROSS AND THORBURN.—On the Segmentary Distribution of Sensory Disturbances, *Brain*, 1888.
305. ROSS, J.—A Case of Syringomyelia, Treatise on Diseases of the Nervous System, vol. i., London, 1883.
306. ROSSOLIMO, G. J.—*Centralbl. f. Nervenheilkunde*, 1889; *Neurol. Centralbl.*, 1892, No. 15, p. 493.
—Zur Physiologie der Schleife, *Arch. f. Psychiatrie*, Bd. xxi. p. 897.
307. ROTH, VLADIMIR.—Diffuse Gliosis of the Cord, Syringomyelia, Muscular Atrophy, *Archives de Physiologie*, 1878.
—On Medullary Gliomatosis, *Arch. de Neurologie*, 1887, 1888.
—*Archives de Neurologie*, xiv.-xvi, 1887-89. (For Cases 1 and 2 of Roth, see Bruhl, Obs. 30 and 31.)
—Recueil des Travaux de Neuropathologie et de Psychiatrie dédiée par ses élèves à M. le Prof. Kojewnikow, Moscow, 1890.
—*Archives de Physiol. norm. et path.*, t. v., Paris, 1878.
—*Neurol. Centralbl.*, 1892, p. 493.
308. ROUFFIET.—Essai clinique sur le rétrécissement du Champ visuel dans la Syringomyélie et dans la Maladie de Morvan, Thesis of Paris, 1890.
309. RULLIER.—Destruction of a Great Part of the Cord, with Contracture of the Arm and Perfect Mobility of the Lower Extremities, *Journal de Physiologie expérimentale*, 1823.
310. RUMPF.—*Neurol. Centralbl.*, 1889, Nos. 7 and 10.
311. RUMMO, G., of Pisa.—Lezioni di clinica Medica, vol. i., Naples, 1894; *Terapia clinica*, 1893, No. 2.
312. RUMPF.—A Case of Syringomyelia, etc., *Neurol. Centralbl.*, 1889. (Bruhl, Obs. 29.)
313. SACHS, B., AND ARMSTRONG.—*New York Med. Journ.*, April 30, 1892.
314. SACHS, B.—*New York Med. Journ.*, 1888.
315. SANTANGELO, F.—Caso clinico di Syringomyelia con Manifestazione tardive della Malattia di Morvan, Pisani, Palermo, 1891, xii. 185-199.
316. SANDER.—*Arch. f. Psychiatrie*, xi., 1880.
317. SASS, A. VON.—Zwei Fälle von Lepa nervorum, *Arch. f. klin. Med.*, Bd. xlvii.
318. SCHAFFER, C., AND PREISS, H.—Ueber Hydro- und Syringomyelie, *Arch. f. Psychiatrie*, Bd. xxiii.
319. SCHLESINGER, H.—Zur Casuistik der partiellen Empfindungslähmung (Syringomyelie), *Wiener med. Woch.*, 1891, Nos. 10-14.
—Beiträge zu den Sensibilitäts-Anomalien bei Lepa anæsthetica, *Deutsche Zeitschr. f. Nervenkr.*, Bd. ii. p. 230.
—Symptomatology of Syringomyelia, *Neurol. Centralbl.*, 1893, pp. 684-688.
—*Neurol. Centralbl.*, 1893, No. 3; *Revue neurologique*, 1893, p. 25.
—*Centralbl. f. Nervenheilkunde und Psychiatrie*, March, 1894, p. 151.
—*Prager med. Woch.*, 1892, xvii. 585.
—Monograph on Syringomyelia, Leipsic and Vienna, 1895.
320. SCHMIDT, ADOLF.—Doppelseitige Accessoriuslähmung bei Syringomyelie, *Deutsch. med. Woch.*, 1892, No. 26.
321. SCHMIDT, MAX.—Inaug. Dissert., Munich, 1894.
322. SCHMITT AND BARABAN.—A Case of Syringomyelia, *Rev. méd. de l'Est*, 1888.
323. SCHULTZE, FR.—Ueber Spalthohlen und Gliombildung im Rückenmark, *Archiv von Virchow*, 1882, t. lxxxvii. (Vide Bruhl.)
—*Arch. f. Psychiatrie*, Bd. viii., 1878.
—Beitrag zur Lehre von der centralen Gliose des Rückenmark und Syringomyelie, *Archiv von Virchow*, cii. 1885. (Vide Bruhl.)

- SCHULTZE, FR.—Klinisches und anatomisches über Syringomyelie, *Zeitschr. f. klin. Med.*, xiii., 1888, p. 523. (*Vide Bruhl*.)
 —Zur kenntniss der Lepra, *Deutsches Arch. f. klin. Med.*, xliii., 1888.
 —*Deutsch. med. Woch.*, 1893, No. 46.
324. SCHULL.—*Deutsches Arch. f. klin. Med.*, xx. p. 271, 1877.
325. SCHÜPPEL, O.—Hydromyelia, *Arch. d. Heilkunde*, 1865, p. 289.
 —Glioma of the Cord, *Arch. d. Heilkunde*, p. 113, 1867.
 —A Case of Generalized Anæsthesia, 1874.
326. SEEBOHM.—Tumor of the Cord with Syringomyelia, Thesis of Strasburg, 1888 or 1889.
327. SEELIGMÜLLER.—Ueber Syringomyelie, *Münchener med. Woch.*, 1891.
328. SHAFFER, KARL, AND DR. HUGO PREISS.—Hydromyelus und Syringomyelie, *Arch. f. Psychiatrie u. Nervenkr.*, xxiii. 1-39.
329. SHAW, J. C.—*New York Med. Journ.*, 1890.
330. SILCOCK.—Syringomyelia, Path. Soc. of London, vol. xxxix., Jan., 1888, and *British Med. Journ.*, 1888.
331. SIMON, TH.—*Arch. f. Psychiatrie*, 1875, p. 120, Obs. 1, 2, 3, 4, 8.
332. SINGER, J.—Two Cases of Syringomyelia, *Prager med. Woch.*, 1892, xvii. 537.
 —*Prager med. Woch.*, 1891, No. 45.
333. SINKLER, WHARTON.—International Clinics, vol. iii., 3d Series, Philadelphia, 1893.
334. SIMON.—Syringomyelia and Tumors of the Spinal Cord, *Arch. f. Psychiatrie*, v., 1875.
335. SPILLER, W. G.—Traumatism and Hæmatomyelia a Cause of Syringomyelia, INTERNATIONAL MEDICAL MAGAZINE, April, 1896, p. 193.
336. SPILLER AND DERCUM.—Trans. Amer. Neurological Association., 1896, and *Amer. Journ. Med. Sciences*, Dec., 1896.
337. SOKOLOFF.—Two Cases of Glioma of the Central Nervous System, *Deutsch. Arch. f. klin. Med.*, t. xli., 1887.
 —Arthropathy in Syringomyelia, *Vratch*, 1891.
 —*Deutsche Zeitschrift f. Chirurgie*, 1892, Bd. xxxiv.
338. SONNENBERG.—Arthropathies, *Berliner klin. Woch.*, Nov. 27, 1893; *Lancet*, June 2, 1894.
339. SOUQUES, A.—Étude sur les Syndromes hystériques simulateurs des Maladies de la Moelle épinière, Thèse de Paris, 1891.
 —A Case of Syringomyelia, Type Morvan, Nouvelle Iconographie de la Salpêtrière, Paris, 1892, v. 286-291; also *Neurol. Centralbl.*, No. 4, 1892.
340. SOUZA-MARTIN, of Lisbon.—International Medical Congress, Rome, 1894, *La Semaine Médicale*, 1894, No. 20.
341. VON SPANJE.—*Weekblatt van het nederl. Tijekr. f. Geneesk.*, 1893, a 1, No. 18.
342. DE SPEVILLE.—Morvan's Disease, Thesis of Paris, 1888.
343. STADELMANN.—*Deutsches Arch. f. klin. Med.*, xxxiii., 1883.
344. STANDHARTNER.—Jahresber. des allgem. Krankhauses in Wien vom Jahre 1891.
345. STARR, M. ALLEN.—*Amer. Journ. Med. Sci.*, May, 1888.
346. STEMBO, L.—*St. Petersburger med. Woch.*, 1892, No. 35.
347. STERNE.—On Syringomyelia, *Indiana Med. Journ.*, Indianapolis, 1893-94, pp. 187-195.
348. STEUDENER.—Syringomyelia in Lepra Mutilans, Obs. 1, p. 7, Erlangen, 1867.
349. STRÜMPPELL, A.—Glioma of the Cervical Cord, *Deutsches Archiv f. klin. Med.*, xxviii., 1881.
 —*Archiv f. Psychiatrie*, x., 1880, p. 695.
450. STENO.—Central Glioma of the Spinal Cord, *St. Thomas's Hospital Reports*, 1885, London, 1886.
351. TAMBOURER.—*Neurol. Centralbl.*, 1892, p. 494.
352. TANZI.—La Siringomielite nella Patologia nervosa e nelle sue Applicazioni alla Fisiologia, *Gaz. d. Osp.*, Napoli, 1891, xii. 571-573.
 —*Rivista sperimentale di Freniatria ecc.*, 1890, fasc. iv.
353. TAYLOR, JAMES.—*Lancet*, Jan. 28, 1893, p. 286.
 —Gumma, *British Medical Journal*, 1883.
 —Syphilitic Meningitis; Gumma and Cavity in the Cord, Trans. Path. Soc. of London, xxxv., 1884.
354. TCHERKASSOW, T., *Mémoires médicaux*, 1894, No. 8.
355. THIBIERZE, G.—Les Altérations cutanées de la Syringomyélie, *Ann. de Derm. et de Syphilogr.*, Paris, 1890, 3 S., i. 799-813.

356. THOMAS.—Syringomyelia in a Child æt. 6 [Hydromyelia?], *Medical News*, Dec. 21, 1895; *Lancet*, Dec. 14, 1895.
357. THOMSON, ALEXIS.—Edinburgh Hospital Reports, vol. ii., 1894.
358. TORNOW.—Berlin Dissertation, 1863 (Diagnosis).
359. TORNU, E.—*Ann. Assist. pub. Buenos Aires*, 1891–92, ii. 281–296.
360. TOURETTE, GILLES DE LA.
361. TURNER, CHARLEWOOD.—Syringomyelia with Dilatation of the Cerebral Ventricles, *Trans. Path. Soc.*, London, 1888.
—*British Medical Journal*, 1887, p. 1281.
362. TURNER, W. A., AND ASHLEY, W. MACKINTOSH.—Three Cases of New Growth with Cavity Formation in the Cord, *Brain*, Parts LXXIV. and LXXV., 1896, p. 301.
363. UPSON, H. S.—A Case of Syringomyelia, *New York Medical Journal*, Aug. 31, 1889.
364. VANDERVELDE.—Anatomie normale et pathologique du Canal centrale de la Moelle épinière, *Jour. de Méd. et de Chirurgie et de Pharmacologie*, 1894, No. 22.
365. VAN GIESON, IRA.—*Journ. Nerv. and Ment. Dis.*, July, 1889, and *New York Med. Journ.*, vol. ii., 1889.
366. VASSALE, G. (REGGIO).—Italian Congress “di Freniatria.”
367. LA VECCHIA, L.—Syringomyelia and Morvan's Disease, *Lavori di Cong. di Med. inter.*, Milan, 1893, 198–211; *Münchener med. Woch.*, Dec. 27, 1892.
368. VERGELY.—De la Dissociation syringomyélique de la Sensibilité chez les Diabétiques, *Gaz. hebdom. de Méd. et de Chirurg.*, 1893, No. 32.
369. VERHOOGEN.—*Journ. de Méd., de Chirurg., et de Pharm.*, 1893, No. 22.
370. VERHOOGEN ET VANDERVELDEN.—*Annales des Sciences médicales et naturelles*, Bruxelles, 1894, iii.
371. VESELY.—Soc. des Médecins de Prague, Feb. 12, 1894.
372. VIERORDT.—*Zeitschrift f. Biologie*, Bd. 12.
373. VINALIS, FR.—*El Progreso médico-farmac.*, 1893.
374. VOLKMANN, R.—Beitrag zur Lehre vor dem Gliom und der secundären Degeneration des Rückenmarks, etc., *Deutsches Arch. f. klin. Med.*, Bd. xlii., 1888, p. 433.
375. VOGHT, WALTER.—*New York Medical Journal*, June 11, 1891, liv. 561–564.
—*New York Medical Journal*, Jan., 1892.
376. VULPIAN.—*Arch. de Physiol.*, t. ii., 1869, p. 637.
377. WEHLAU, L.—*Medical Record*, Dec. 12, 1891.
378. WEINTRAUD, W.—Zwei Fälle von Syringomyelie mit Posticuslähmung und Cucularisatrophie, *Deutsches Zeitschr. f. Nervenheilkunde*, 1894, p. 383.
379. WESTPHAL, C.—A Case of Tumor and of Cavities of the Cord with Alteration of the Medulla Oblongata, *Arch. f. Psychiatrie*, 1875, t. v. p. 90; *Brain*, vol. vi., July, 1883.
—Contribution to the Study of Syringomyelia, *Brain*, 1883.
380. WHIPHAM.—Glioma of the Cord with Dilatation of the Central Canal, *Trans. Path. Soc. of London*, March, 1881, and *Lancet*, 1881, p. 418.
381. WICHMANN, RALF.—Ueber Geschwülst und Hohlenbildung im Rückenmark, Tübingen, 1887 (32 cases), Stuttgart, 1887. (*Vide Bruhl*.)
382. WEISS.—*Revue neurologique*, 1893, p. 137.
383. ZAMBACO-PACHA.—Les Léproux de la Bretagne; communic. faite à l'Académie de la Médecine, Aug. 23, 1892, Paris, Masson.
384. ZAMBACO.—*La Semaine Médicale*, 1893.
385. ZAMBACO ET G. THIBIERGE.—Lèpre anæsthésique et Syringomyélie, *Gaz. hebdom.*, 1891, No. 2.
386. ZIEHL.—*Deutsch. med. Woch.*, 1889, No. 17, p. 335.

Addendum.

387. DIMITROFF, STEPHAN (of Adrianople, Turkey).—*Archiv für Psychiatrie und Nervenkrankheiten*, xxviii. Bd. 2 Heft and xxix. Bd. 1 Heft, Berlin, 1896, 82 pp. This essay contains a valuable synopsis of 297 cases hitherto published, classified in four groups.
388. SAXER, F. (of Marburg).—*Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie*, xx. Bd. 2 Heft, Jena, 1896, 66 pp.

PYOTHORAX.

BY CARL BECK, M.D.,

Professor of Surgery, New York School of Clinical Medicine; Surgeon to St. Mark's Hospital, German Polyclinic, West Side German Dispensary; Consulting Surgeon, H. S. G. S. Orphan Asylum; Honorary President, Section of General Surgery, Second Pan-American Congress, etc., New York.

History.—The treatment of pyothorax dates back to the remotest antiquity, and marks one of the most brilliant eras of pre-Hippocratic surgery. It is reported that Euryphon of Cnidos saved the life of Cinesias by opening the chest wall with the actual cautery. In the seventh book of the "History of Nature," Pliny describes the case of Pharaeus, who, after having been given up by his physicians, sought death on the battle-field, but when thrust in the chest by a spearman, was escaped from the wound, and the seeker of death recovered, having been cured by the weapon of his enemy.

There can be no doubt that thoracotomy for pyothorax was performed by the great master Hippocrates. A study of his book, "De Morbis Popularibus," will convince the most sceptical that long before this the opening of the chest wall was an established operation, the indications for which were well defined. These could be brought to such a degree of precision only as a result of the very frequent and extensive employment of different operative procedures, as free opening by the knife, the actual cautery, and the trephining and exsection of a rib. Hippocrates laid great stress upon washing the patients very frequently and with very warm water before the operation was performed. Does not this extraordinary cleanliness appear like the dawn of aseptic principles? Is it not an explanation of the operations performed at that early time with such signal success that some are inclined to doubt the authenticity of the records? In this connection, the modern surgeon may recall the frequent washings by the Hebrews,—a religio-physiological rite ordained by Moses, who doubtless was one of the greatest judges of human requirements.

The diagnosis of pyothorax, as described in Hippocrates's book, "De Morbis Popularibus," is based upon the auscultation of a "splashing sound, while the patient was shaken," and "a noise similar to the one to be heard when vinegar boils. Furthermore were considered the character of the respiration, the position of the patient, the eventual swelling of the diseased side, the fever, the pain, and the hydrops which was present now and then."

In reference to the technique of his operation, the advice is given "to prepare the patient, fifteen days after the onset of the disease, by washing him first very thoroughly with warm water. Then the patient had to be

placed upon a chair. After his hands were tightened, he was shaken by his shoulders, in order to ascertain, by the perception of the splashing sounds, which side was the diseased one. The incision had to be made far down on the most dependent part of the pleural cavity. After the skin was divided with a sword-like knife (*μαχαίρις στηθοειδής*), surrounded by an adhesive mass up to three-quarters of an inch from its tip, a long, thin scalpel (*ἐπειτα ὀξυβελεί' ἀποδήσας ῥάχει*) was thrust into the pus-cavity. As soon as a part of the pus was discharged, the wound had to be closed by a piece of raw linen, to which a strong thread was attached. The cavity had to be evacuated once every day. After the tenth day warm wine and oil were infused every morning and evening. If the pus was of a watery and sticky character and also of considerable quantity, a tube of tin was introduced and shortened gradually according to the progress of the healing process. If the left side was concerned, the prognosis was better than when it was the right one." In Article xlv. ("De Morbis," II.) the following prognostic hints are given:

"If the pus is white, clean, and slightly bloody, a cure is effected in the majority of cases. But if it be thick, greenish-yellow, and malodorous, *exitus letalis* has to be expected."

There can be no doubt that, based upon such perfected diagnostic means, thoracotomy was performed frequently and successfully during the splendid Hippocratic era, and that the most of its admirable knowledge was lost during the twenty-three centuries that have followed.

A slight indication of what the medical world has lost of the immense knowledge of the school of Cos, and how highly educated Roman surgery must have been, can be gained by visiting the so-called "house of the surgeon" at Pompeii. The extremely large number of small wells in this house suggests, as it seems to me, at least a vague knowledge of the principles of asepsis. The streams of water constantly flowing through the streets of Roman cities were certainly adapted to remove pathogenic bacteria. By visiting these old relics of a great past, one may feel how little advanced in many respects is the present age, when compared with the medical civilization of many centuries ago. Why should not the ancient surgeon, with his fine art of diagnosis and with his powerful weapon "cleanliness," have obtained better results than the surgeon of later years, who, after washing his hands superficially in non-sterile water, went directly from an autopsy- to the operating-room! There, alas! the masterpiece of anatomical demonstration was repeated on the living patient, who was thus frequently turned into a subject for the autopsy-room.

Interesting witnesses of this grand era are the perfect instruments made of steel and bronze, which were excavated at Herculaneum and Pompeii, and which are exhibited now in the Vatican at Rome and in the Museo Borbonico at Naples.

Celsus and Galen still repeated the doctrines of Hippocrates, but later on the whole subject dropped into entire oblivion. During the Middle

Ages thoracotomy was mentioned and performed, but only sporadically, by Ambrose Paré, Fabricius ab Aquapendente, and Jerome Goulou. Heister, the greatest German surgeon of the eighteenth century, mentioned the operation as a most unsatisfactory one, and Corvisart, the celebrated surgeon of Napoleon, said that thoracotomy always accelerated death. Thus, when Sédillot had the courage to bring the operation to light again, it is not surprising that it was not greeted enthusiastically. His results, indeed, were so discouraging that the greatest surgeon of his time, Dupuytren, when himself suffering from pyothorax, declined to be operated on, uttering the classical words, that "he would rather die by the hands of God than of the doctors." Bearing in mind that the great Velpeau had lost all his cases of pyothorax, and that, of fifty cases, Dupuytren had only seen four recoveries, his conviction can be well appreciated. Most of these cases, however, be it well understood, were treated by aspiration. Later on Sédillot, seconded by Langenbeck, recommended the trephining of a rib.

But it was reserved for the great discovery, antiseptis, to elevate thoracotomy to the high pedestal which it at present occupies. Especial credit is due to the surgeons Roser, Simon, Volkmann, Lichtheim, Schede, Küster, and König; but it should not be forgotten that the great internists, Kussmaul, Bartels, and Gerhardt were the pioneers in establishing the proper indications for the operation. Much credit is due to our great countryman, Bowditch, for having first recommended exploratory punctures for diagnostic purposes, a procedure of highest practical value. It now became customary, particularly through the efforts of König, to combine the resection of a piece of a rib with thoracotomy in suitable cases. Schede, Bardeleben, Runeberg, Billroth, Rydygier, Ziemssen, Glaesser, Raczynski, and in this country, Weir, Bull, McBurney, and Lange recommended the method. It was, however, understood that resection should be performed, especially in adults and in cases of long standing, while aspiration and simple incision should be preferred in children. I may be permitted to state that as early as 1882 I advised resection of a piece of a rib in all cases of pyothorax without exception, as this method offers the best means, not only for sufficient drainage, but also for thorough palpation and inspection of the cavity. This radical step, the proposition and practice of which have brought upon me the most bitter attacks, has nevertheless been endorsed by many surgeons.

As early as 1869 the genius of Gustav Simon found a way to heal old pyothoracic cavities by resecting from three to seven long pieces of ribs, thus mobilizing the thoracic wall and enabling it to adapt itself to the contracted lung. Let me take this opportunity to give due credit to this eminent surgeon, who also performed the first nephrectomy, for his ingenious method,—an operation which, strange to say, is attributed to Estlander of Helsingfors. Simon presented cases successfully treated by him by the method described above before the Society of "Mittelrheinische Aerzte,"

at Mannheim, in 1870, but his untimely death prevented him from claiming his priority. An excellent American surgeon, Warren Stone, of New Orleans, also performed the so-called Estlander operation long before Estlander, and so did both Küster (1873) and Schede.

Lately Schede obtained the most admirable results in old pyothoracic cavities by removing the whole walls, including the ribs and pleura.

Etiology and Bacteriological Examination.—If inflammation of the pleura is influenced by a specific pyogenetic cause, pyothorax is self-originating. Unless sometimes from a traumatic cause, pleuritis is but seldom of an idiopathic character; it develops generally from a preceding disease, as croupous pneumonia, pleuro-pneumonia, gangrene of the lungs, hemorrhagic infarction, tuberculosis, pericarditis, peritonitis, nephritis, osteomyelitis, œsophageal and tracheal ulcers, spondylitis, and appendicitis. The infectious diseases, particularly measles, scarlet fever, influenza, sometimes diphtheria and small-pox, are also important causative factors. During the great grippe epidemic in 1889–90 pyothorax was extremely frequent.

Pyothorax may also be caused by the perforation of a subphrenic abscess into the pleural sac. Such subphrenic abscesses may be of stomachic, intestinal, appendicular, hepatic, cholangioitic, and of perinephritic origin. Septic infection, the various types of tonsillitic and peritonsillitic processes, and retropharyngeal abscess may also be precursors. Several times I have seen pyothorax follow grave forms of gastro-enteritis. According to Koplik ("The Bacteriology of Empyema in Children," *Archives of Pediatrics*, February, 1896) a streptococcus-pyothorax may be caused even from a slight, infected wound.

The specific causative factors of pyothorax, as well as of pleuritis, are not sufficiently known. It is still *sub judice lis* whether in these modern times the old theory of a "cold" can be seriously considered.¹

There can be no doubt that immediately after camping on cold, moist ground, or after being wet through by rain, the symptoms of such diseases, like those of rheumatism and other acute complaints, may suddenly appear. Such facts happen so frequently that they deserve our attention.

It seems that on such occasions micro-organisms which had previously settled in temporary innocence in the organs of apparently healthy individuals are set free by some accidental irritation, such as that of a cold. While proof of such theory cannot, of course, be furnished, this much is certain: that even among the most hygienic surroundings the surface of the body is covered with pathogenic bacteria. Even the most virulent species are found in the mouths of healthy persons. From this well-proven fact we must necessarily conclude that it is not bacteria alone which produce the disease, but that, besides the germ and the favorable soil neces-

¹ There is no doubt that the rapid variations of climate so characteristic of the State of New York predispose more to pleuritis and pleuro-pneumonia than the more equable climates of other parts of the country.

sary for its further development, certain other conditions are required, the true nature of which we are still unable to determine. They may act upon the economy by reducing its vital resistance. Diathesis, or disposition, the term so often praised and so often ridiculed, is undoubtedly an important factor here, and particularly to tuberculosis.

The precursor of pleuritic effusion in the vast majority of cases is pneumonia. Why in one case pneumonia takes its well-known regular course and in another is followed by a serous effusion, which is absorbed, and why in still another case it gives rise to pyothorax, is also not explained. The existence of a so-called idiopathic pleurisy is doubted, and it is assumed that if pleuritis attacks a person who was apparently healthy before, the disease is of a tubercular character.

It would exceed the limits of this article to amplify these theories further. We may, however, learn from them that the specific causative factors of pleuritis, as well as of pyothorax, are not yet sufficiently elucidated. Whether in some cases of pyothorax the pleuritic effusion was of a serous character first and became purulent later on is not yet proved. It seems that even the so-called serous effusions, which later on "turned into pyothorax," contained the pus-producing elements from the beginning of the process, which can, of course, not be recognized macroscopically.

It was expected that the youngest branch of the medical sciences, bacteriology, would bring more light, but the most of its achievements thus far are of a problematic character; still, the investigations of eminent workers in this branch (A. Fränkel, E. Levy, Prudden, Koplik, Netter, Weichselbaum, and Prince Ludwig Ferdinand of Bavaria) have shown that the pyogenous bacterium most frequently found in pyothorax is the streptococcus. This coccus could be especially cultivated in cases of pyothorax due to trauma, caries of the ribs, pneumonia, and tuberculosis of the lungs, and also after pyæmia and septicæmia.

Many pyothorax cases, particularly the so-called metapneumonic empyemas, are caused by the pneumococcus. A considerable number show the staphylococcus albus and aureus. The pneumococcus is more prevalent in children, while the streptococcus is much more frequently found in adults. Sometimes the pneumococci and the streptococci are present at the same time, and it often happens that several varieties of bacteria are found together.

During the influenza epidemic the influenza bacillus has been frequently found in the protoplasm of the pyothoracic pus-cells by R. Pfeiffer. The typhus bacillus, the bacillus coli communis, and the micrococcus tetragenus and proteus are also found in pyothorax.

It is to be regretted that the most ingenious bacteriological investigations concern only the pus, but not the diseased tissues.

In tuberculous effusions, be they of serous or of a purulent character, the tubercle bacillus was rarely found. If there is any suspicion in this direction it is advisable to rely upon the inoculation experiment,—viz., to

inject some of the aspirated fluid into the peritoneal cavities of rabbits, mice, or preferably of guinea-pigs. Thus, the tubercle bacillus was often demonstrated by the development of tuberculosis in the animal. Two to three months will elapse, however, before such information can be obtained. When the animal is killed, tuberculous nodules from the size of a pin to that of a bean are found, particularly in the large omentum, and in other abdominal organs.

As to the significance of different pus-producing bacteria, it may be stated that the streptococcus is found in many, indeed, in at least half of all cases of pyothorax. As this coccus is most commonly found in suppurative processes, and has its domicile constantly in and on the most healthy persons, it is self-evident that it will also be present very frequently in pyothorax. It seems that this micrococcus especially tends to the formation of solid masses. Its predilection is, as we have seen, for adults, and particularly for infectious diseases.

Fränkel's pneumococcus is more prevalent in the primary pyothorax of children, about twenty-five per cent. occurring in adults and seventy-five per cent. in children. The cases in which this coccus is discovered show the most benign character of all, so that there is some inclination to attribute this to the coccus; but it seems to me that the vitality of the organs and the compliance of the thoracic walls are the main factors in the more benign character of pyothorax in children.

The staphylococcus aureus and albus, which also show a benign character, are found in pyothorax not infrequently.

In tuberculous pyothorax the tubercle bacillus is, in the majority of cases, absent. The absence of the tubercle bacillus, therefore, does not disprove the presence of tuberculosis. There are cases where the tubercle bacillus is found, and in others only streptococci, staphylococci, and several mixed forms were demonstrated. But inoculation experiments showed beyond doubt the presence of tuberculosis. In one hundred and nine cases of pyothorax Netter found the streptococcus fifty-one times; the pneumococcus, thirty-two times; the bacillus tuberculosis, twelve times; and saprogenous organisms, fifteen times. Among the latter, proteus and sarcines may be mentioned.

Of seventy-four cases of pyothorax coming under my observation within the last three years, forty-nine were examined bacteriologically. There were found: streptococci, sixteen times; pneumococci, ten times; staphylococci, four times; saprogenous micro-organisms, twice; tubercular bacilli, three times; in the remaining four cases no micro-organisms were found. In three cases, in which no micro-organisms could be cultivated, the injection into the peritoneal cavity of a guinea-pig produced tubercular infection.

As to the technique of bacteriological examination of thoracic effusions, it should be borne in mind that the skin of the patient, the hands of the surgeon, and the aspiratory apparatus, particularly the needle, must be

thoroughly aseptic. Rigorous brushing of the skin with soap and hot water, rubbing with alcohol, and afterwards washing with bichloride must always precede the aspiration, which practically must be regarded as a surgical operation.

As an additional precaution, the skin must be dislodged before introducing the needle, so that the stitch-canal in the skin and the one in the underlying tissues shall not be in line (see my manual on surgical asepsis, Philadelphia, 1895, chapter xiv., on aseptic injection). The left index-finger is pressed into the intercostal space to steady the skin, then the needle is pushed forward slowly. If a purulent effusion is represented by a very thick cheesy mass, the aspiration will most naturally be negative. The same result may be expected when the needle is thrust into thick adhesions or into a thick fibrous pleural sward, or if the calibre of the needle be blocked by a fibrinous coagulum.

Therefore, when pyothorax is suspected, the needle must be introduced several times at different portions, and when this also fails, a very large canula (a thin canula may also break in a restless patient) should be tried, to see whether thick pus could not be drawn through it. Sometimes it is preferable to push the needle far forward, pull out the piston, and then withdraw it very slowly.

After each negative result it is also advisable to put a wire through the needle, thus removing any pus which may remain adherent to the inner surface of the needle. Occasionally it will be useful, after the operation, to fill the syringe with sterile water, and force the water through the needle into a Petri dish. In case cheesy masses are present, small particles are sometimes drawn into the calibre of the needle, which cannot be seen by the unaided eye, but which, by being mixed with the sterile water, can be recognized under the microscope. In case the microscope does not give sufficient information, resort should, of course, be had to cultures of the fluid. Staphylococci are easily recognized on agar-cultures; while it is not easy to distinguish between streptococci and the pneumococcus, as the cultures on agar appear very much alike. But the difference between these two cocci can be made more marked after inoculation upon rabbits or white mice.

Bacteriological means are not sufficiently far developed to be practically utilized to any extent by the physician in general. When the benign character of the pyothorax is demonstrated by the presence of the pneumococcus, it has been advised to aspirate the pus instead of opening the chest wall. But in the section on criticisms we shall see that this recommendation must be taken *cum grano salis*.

Diagnosis.—The diagnosis of pyothorax is easy in the great majority of cases. The usual symptoms are grave, and may be summarized as follows:

History of preceding diseases, such as pneumonia, etc. (see foregoing remarks), suppurative processes in the neighborhood, pyæmia, etc. Further-

more, high and continuous fever at the beginning, later on intermittent and interrupted by cold chills, great exhaustion, headache, dry tongue. In cases of long standing, œdema of the thoracic wall is observed. Percussion reveals perfect dulness. It should be borne in mind that in pneumonia the feeling of resistance is much more pronounced, and that between the dull areas tympanitic sounds are found. Percussion also shows that the neighboring organs are always more or less displaced. Auscultation reveals absence of the respiratory sounds, or at least weakened respiration. With the new phonendoscope fine distinctions seem to be much easier than with the common stethoscope. The vocal fremitus is also either weakened or absent. In pneumonia the vocal fremitus is increased.

To these rules, however, there are many exceptions. The main differential points in regard to pneumonia have just been noted. Other sources of error occur in growths of the pleura and of the lungs (sarcoma, carcinoma, lymphoma), which also at times produce effusion. In such cases the slow course and the entire absence of fever are pathognomonic. If, in such cases, an aspiratory needle is introduced, it can be felt that the needle passes through hard masses. Microscopical examination of the cells, which are generally contained in the aspirated blood, furnishes information in nearly all such cases. Abscess of the vertebræ, echinococcus of the lungs, and actinomycosis may also raise a question.

Pyothorax is also often confounded with subphrenic abscess. Here it should be borne in mind that in subphrenic abscess there is generally a history of previous abdominal disturbance. There is no history of cough and expectoration, as in pyothorax. The heart is little if at all displaced, and there is no excessive action of the thorax or of the intercostal spaces. In the lungs, vesicular breathing is found below the clavicle, and pectoral fremitus is also clearly perceptible. There is a well-marked limit to the region of vesicular breathing, below which the expiration murmur is replaced by amphoric sounds. Deep inspiration pushes the boundary-line of the region of vesicular breathing much farther down, into areas in which formerly no respiratory murmur could be perceived. This would indicate a well-marked separation between the lungs and the abscess cavity, the boundary-line of the lungs protruding towards the abscess cavity during deep inspiration.

It is sometimes impossible to distinguish an encysted pyothorax from a subphrenic abscess. The pathognomonic signs of such accumulations, as urged by Leyden, were absence of cough and rapid change of note if the patient is rapidly turned. But, according to my observations, pleuritic effusions, particularly pyothorax, sometimes occur without showing these symptoms. (See "Pyothorax and its Treatment," *Medical Record*, May 13, 1894.) An error in this direction, however, will be of little importance practically, inasmuch as the treatment of subphrenic abscess is the same in principle as is that of pyothorax.

As before stated, to all these rules there are many exceptions. Fortu-

nately we possess an absolutely safe guard for verifying our suspicions. It is the aspiratory puncture. When properly used, this will always give the desired information. Sometimes a good deal of patience is required, inasmuch as the needle must often be introduced until fluid appears. It may happen that the pus-cavity may either be of small extent or may contain a cheesy accumulation, or may be divided by adhesions into several minor cavities. Or the needle may reach a pleural band of great thickness,—I have seen them up to the diameter of one and a half inches, and have repeatedly performed the resection of such hypertrophied pieces.

In exceptional cases one may be surprised by the result of the exploratory puncture in spite of the most minute considerations of all rules bearing upon this subject.

It may, indeed, happen that all the classical symptoms, as described above, may be absent, and still pyothorax be detected at last. I have repeatedly found pus only after many aspirations were made; as in a case where the cavity was almost filled up with a cheesy mass, the liquid pus present amounting only to a trifle. In such a case it is natural that the needle, by being introduced into these solid masses, cannot draw any pus. The same negative result can be obtained in a case where there are large fibrinous masses in serous effusions.

To illustrate the peculiarities of exceptional cases I may be permitted to direct attention to a pyothorax in a child, seven years of age, of which diphtheria was the precursor. Here the very distinct dulness began at the lower margin of the right fifth rib. The respiratory sounds were less audible above this dull area, while beyond there were entirely normal conditions. After having aspirated five times in vain on different portions of the dull area, I succeeded at last in finding a trifling amount of pus at the lower margin of the fifth rib,—that is, on the beginning of the dull area. After having resected the sixth rib and introduced a small grooved director through the costal pleura, no pus was discovered, to our great surprise (Drs. Breitenfeld, Childs, and Lowenthal being present). The diaphragm bulged forward through the incision, thus rendering further examination very difficult. By leading an aspirating needle slowly and carefully upward alongside the internal thoracic wall I reached a cavity, containing three-fourths of a pint of cheesy pus, which extended from the upper surface of the fifth rib up to the upper margin of the second. The patient recovered. There must have been by the adhesive bands means of a transmission of physical signs through the cheesy pus to the periphery below.

It has furthermore to be considered that there are exceptional cases of pyothorax where the pus-cells have settled down like a sediment to the bottom of the abscess cavity, while above a collection of a clear serous fluid is found which, if aspirated, would necessarily leave the surgeon under the conviction that no pyothorax existed at all. Such misapprehension may come all the easier if the exploratory puncture is made high up. This fact teaches also that punctures should be made below as well. It should, how-

ever, not be forgotten that it is just in the most dependent part that clots are likely to settle and to clog the exploratory needle. If in such a case absorption of the fluid should take place, and the sediment-like pus should undergo thickening at the same time, the result of the aspiration, being negative, would ordinarily give no information as to the true state of the pleural sac.

In regard to the technique of the aspiration, I also refer to the foregoing chapter on etiology and bacteriological examination. If asepsis has been thorough, no damage will result from the puncture.

Operative Treatment.—The treatment of pyothorax can only be surgical. The principles of it are governed by the same as those which are determining in any case of a large abscess,—that is, *thorough evacuation and drainage*. This can only be procured by making a wide opening in the chest wall.

This demand is so simple that it is hard to understand the still antagonistic attitude of so many to this fundamental surgical maxim. A wide opening can only be attained by combining the incision with the resection of a piece of a rib, the latter being such a simple and easy operation that any surgeon can unhesitatingly perform it.

As I practise it at present, its technique is as follows: Thorough asepsis is just as necessary as in any other operation. Particular attention must be given to the skin of the patient and to the hands of the surgeon, scrubbing with green soap first for three or four minutes, then washing with alcohol or ether, and subsequently with bichloride (1:500). To sterilize the skin of the patient thoroughly, it is advisable to cover the field of the operation (the hair in the axilla must first be shaved off) with a poultice of green soap. If there is enough time the poultice may remain for twenty-four hours. I regard this as an essential factor for the disinfection of the skin, because I do not believe that under ordinary circumstances the epidermis, which shelters a multitude of pathogenic bacteria, can be rendered sterile by the usual methods of disinfection, which generally are not carried out longer than from ten to fifteen minutes. A period of twenty-four hours gives the soap a chance to permeate the epidermis thoroughly, so that scrubbing on the following day is much more effective. Sometimes, indeed, the poultice macerates the epidermis so that it can be wiped off easily. Shortly before the operation the skin is scrubbed with gauze-mops dipped into alcohol, the use of which is much more important than that of any antiseptic drug, as it dissolves the fat of the skin. Bacteria as long as they are embedded in fat will not be influenced at all by the strongest antiseptic medicament.

After these precautions are taken the skin must necessarily be free from bacteria; whether, after all this, bichloride will be required is questionable.

While the patient is being anæsthetized the area of operation is surrounded with aseptic towels.

All the paraphernalia needed at the operation must, of course, be ster-

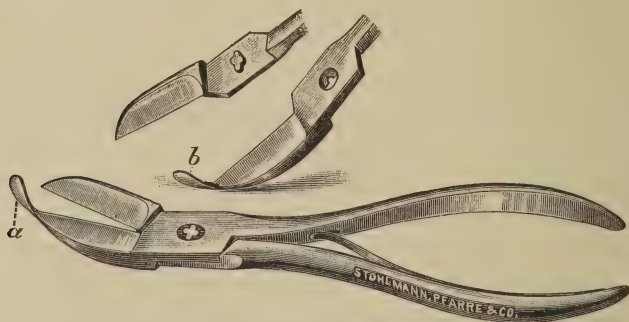
ilized: the instruments, ligatures, etc., in boiling soda solution, and the towels, sponges, etc., in steam. If no sterilizer be at hand, the towels, sponges, etc., can also be sterilized in boiling water.

As a rule, the seventh, sometimes the eighth or ninth rib is selected. If I have the choice, I prefer the median axillary line as the centre of the incision, as thence the abscess walls can be reached equally well in front and behind. It also enables the patient to be brought to the edge of the table during the operation, and permits him to assume the dorsal decubitus; whereas, if the incision were made farther back, he would be obliged to lie on the healthy side, thus rendering evacuation more difficult. If, however, the dull area, as sometimes occurs in abscesses of small extent, is far from the median axillary line, the resection must take place at the point where the aspiratory needle revealed the pus.

It would, of course, answer the simple surgical rule emphasized by Hippocrates to make the opening at the most dependent part of the cavity. But it must be borne in mind that by following this sensible maxim in this case, the error has repeatedly been committed to incise the diaphragm and even the peritoneum. In cases of short standing the diaphragm rises immediately after the evacuation of the cavity. I have even noticed that after the resection was made at the seventh rib, the opening in the thoracic wall became occluded by the uprising diaphragm.

The incision, about four inches in length, should be made directly down to the periosteum of the rib selected. Its direction must of course be parallel to the margin of the rib. An incision is then made along both borders of the rib, and the periosteum both in front and behind is raised by means of a periosteal elevator. Having freed the periosteum, the

FIG. 1.



Elevatorium shears.

elevator is pushed beneath the rib, between it and its posterior periosteum, and allowed to rest on both edges of the wound. With a blunt hook the tissues are retracted along the rib towards the axilla, and by means of a bone scissors the rib is cut between hook and elevatorium. Next, the elevatorium is pushed towards the sternum, forcing the rib from the last

fragment of adhering periosteum ; the retractor is inserted into the end of the wound, and with the scissors this manœuvre is executed.

If my own elevatorium shears (Fig. 1) are used, nothing is needed but to tear away the connection between the periosteum and the rib and divide the rib, the instrument being of such a shape as to keep the tissues properly retracted. One blade, if separated, can be used as an elevatorium, so that with nothing else at hand but a knife and these shears, practically the whole operation could be performed.

Several modifications of this instrument have been made since.

FIG. 2.



Shears introduced from below upward.

FIG. 3.



Shears introduced from above downward.

Dr. Henry Koplik found it advisable to construct a rib-shears after the model of my elevatorium-shears for the use of the left hand also, the essential part of this instrument being that the flat side is left out. It is certainly convenient sometimes to have two shears, but it is not necessary, as my instrument can be introduced from below upward (Fig. 2) as well as from above downward (Fig. 3), thus making it available for both hands.

A piece three inches in length in children and three and a half to four inches in adults is resected. In very large cavities, as especially found in cases of old standing, two or three ribs are resected.

During these manipulations it is impossible to strike the intercostal artery on account of its anatomical situation, while in performing simple incision this accident has frequently occurred.

A saturated solution of iodoform in ether is then spread upon the wound surface to form a protection against the escaping pus, aseptic tampons may also be pressed against the wound surface for the same purpose.

The very thin thoracic fascia and the costal pleura are now incised, the opening being just wide enough to permit the introduction of a grooved director. As soon as pus appears in the groove of the director a small Péan forceps is introduced, and the opening is gently dilated. Evacuation of the pus must take place slowly, as rapid evacuation might produce fatal anæmia of the brain, on account of congestion of the lungs. The time for evacuation may be from twenty to thirty minutes. A sponge should be pressed against the opening from time to time to interrupt the stream, thus avoiding too rapid expansion of the lungs. The pulse, the respiration, and the color of the face should be watched very thoroughly during these manipulations.

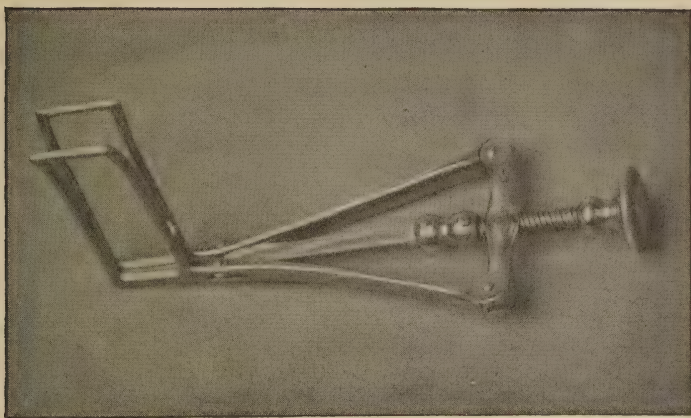
If the condition of the patient permit, the finger is now introduced, and any solid masses, such as fibrinous lumps or necrosed tissues adhering to the abscess wall, are wiped with the index-finger or with sponges fastened to a sponge-holder, or even with a blunt spoon, which I advise for that purpose. By now introducing the pleural speculum (Figs. 4 and 5) advised by me, the whole cavity can be inspected. Further cleaning is then an easy matter. The solid masses are best brought out by an irrigation with a sterile normal salt solution. When malodorous pus is found, an antiseptic wash, preferably bichloride of mercury (1 : 5000), is used for this instead.

If hemorrhage should have occurred, or if signs of shock are present, such procedures may be deferred for a day or two.

The costal pleura is now stitched to the skin with four silk sutures (on suppurating wounds I used to prefer iodoform-silk sutures), one at each end of the wound and one on each side, with strong Hagedorn needles, for ordinary needles break easily when handled here. Thus the wound surface is entirely covered, and the adjacent tissues are protected against infection. At the same time secondary hemorrhage is thereby prevented and the wound kept open. (This procedure I used to term "pleurostomy.")

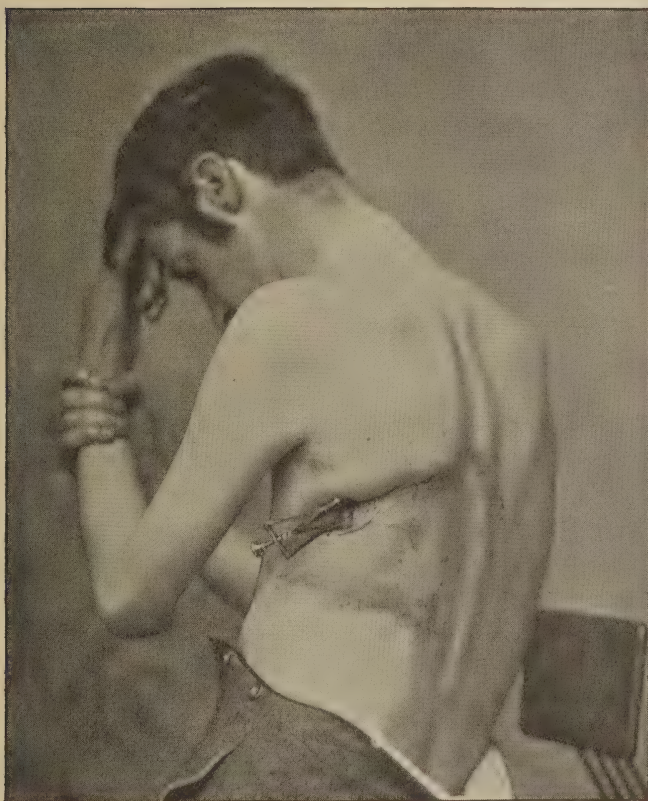
If more than one rib is to be resected, the periosteum of the rib below is divided and the rib resected in the same manner as the first one. (Fig. 6.) The costal pleura underneath is also incised, a large aneurism-needle is afterwards introduced through one of the pleural incisions, and conducted underneath the costal pleura to the other. With strong silk sutures the tissues, containing fascia, muscles, periosteum, costal pleura, and intercostal arteries,

FIG. 4.



Pleural speculum.

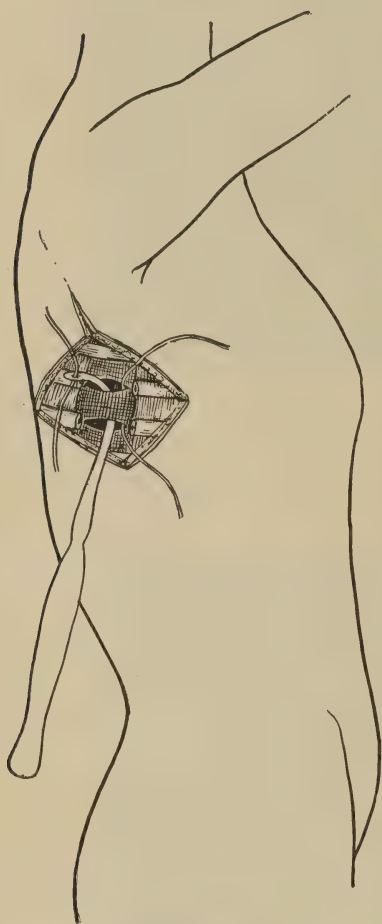
FIG. 5.



Pleural speculum *in situ*.

are ligated close to the cut surface of the rib. Then a vertical incision is made through the tissues between the two ligatures, thus creating a wide opening. If the skin is forcibly retracted, the skin-incision can be utilized for the resection of the rib above. The

FIG. 6.



Needle in situ.

whole side is then protected with a large piece of moss-board, which, after being slightly dipped in water, adapts itself to the contour of the body like a plaster-of-Paris dressing. The dressing should, however, be applied while the patient assumes the dorsal decubitus, as sudden anæmia of the brain might be caused by the erect position.

The whole pus-cavity is packed with iodoform gauze, a narrow strip, several yards long, being preferable for that purpose. The packing is done tightly for the first day in order to prevent hemorrhage, later on loosely.

It is only after such rigorous procedures as I have described that the cavity can be pronounced entirely evacuated. No necessity for subsequent irrigation arises, as all obnoxious elements were removed.

Full anæsthesia should be administered only if the pulse is strong. This is an exceptional circumstance in all cases of abscesses that have existed for a long time. It is well known to what immense dangers a

general anæsthetic exposes the thoracic organs when their functions are so much impaired by compression. Ether being contraindicated in every respiratory disturbance, only chloroform could be employed; and I need not call attention to the danger to which the use of this paralyzing drug subjects the heart. Since the operation takes but a few minutes for a well-trained surgeon, it would be better to use an ether spray when an anæsthetic is required. Even cocaine has its dangers. If chloroform is employed, only a few drops should be poured into the mask at a time, and the pulse, the respiration, and the color of the face should be very carefully watched. A hypodermic syringe for the use of stimulants (strophanthus, camphorated oil), tongue-forceps, and mouth-opener must be close at hand.

After-Treatment.—The packing with iodoform gauze renders after-treatment very simple. It has the great advantage that no subsequent

irrigations are required. This is an important factor regarding not only the irritation resulting, which has repeatedly caused sudden death, but also because it prevents the formation of those very adhesions which are so much needed for the obliteration of the cavity. How important these adhesions are for the agglutination of the pleuræ was emphasized as early as 1865 by Dr. A. H. Smith, of New York City.

No frequent change of the position of the patient is required, as is the case under treatment with drainage-tubes, the use of which I had always regarded as a great evil in former years, when I was too timid to try the more radical methods of my present practice. All the pus is absorbed by the iodoform gauze in the cavity, this preventing its stagnation. Consequently there can be no decomposition, and, therefore, no fever.

The first dressing must be renewed after twenty-four hours, as, during the first few days, the discharge is generally quite abundant. Then the dressing, except in the presence of malodorous pus, need not be changed more frequently than every second or third day. The patient, if at all able, should get up after one week. During the first few days of the after-treatment small doses of morphine are administered for the purpose of immobilization, especially when cough is present. If the pulse be weak, strophanthus and caffeine may be added. Nourishment is given frequently and in small quantities to avoid distention of the stomach.

If the pyothorax be of short standing the cavity may become obliterated in two or three weeks. In one of my cases, that of a child six months of age, obliteration was perfect six days after the resection, but this, of course, was a very exceptional occurrence. In older cases it may take months. The average time for cases of short standing is four weeks. Thoracic fistula remained in none of my cases treated in the manner described. The dressing acts like an aspiratory valve, which yields to the internal expiratory pressure, the latter often being intensified by cough, etc., while, at the same time, it resists the inspiratory external pressure. In cases of short duration it is astonishing that as soon as at the change of the first dressing the lungs are found well distended again, the percussion is normal, and auscultation reveals vesicular breathing above the formerly dull area.

Such occurrences show that the atmospheric pressure, which is erroneously regarded as hindering the early inflation of the lungs, can be of but little importance in this connection.

The healing process does not take place by granulation, but by the distention of the lungs. Where the pulmonic pleura turns in the costal, where, in other words, the lungs touch the thoracic walls, a portion of the distending lung tissue adapts itself to the costal pleura, where it becomes agglutinated by fibrinous adhesions.

Prognosis.—If we exclude septic and tuberculous cases, the prognosis of pyothorax rests entirely upon the early diagnosis. In other words, the family physician is responsible before any other individual for the final outcome.

Among the large series of my cases of this type I do not recollect a single one, in fact, which did not recover. The operation itself is entirely void of danger if done under the precautions described above. The gratifying results obtained in my cases I can only attribute to the thorough evacuation made, and particularly to the removal of the solid masses found in the great majority of cases. In seventy per cent. of my own cases I found them present to a greater or lesser extent. No method except resection enables the surgeon to introduce his finger, which procedure renders examination of the cavity possible and permits of thorough evacuation at the same time.

So far there is no method which shows with any possible degree of probability *before operation* whether such fibrinous or cheesy masses are present. All we know is that the streptococcus has a predilection for the inhabitation of solid masses. Yet recently, in my own cases, the streptococcus has been found several times where no solid masses were present. A large opening, which can be insured only by the performance of a resection, allows inspection and palpation of the cavity and represents the only means to diagnose the presence of the solid masses. So long as we can get no information about this most important point by other methods, resection should always be preferred for this reason alone.

If performed late in an emaciated patient whose strength has gone under expectant treatment, resection will often not avert the fatal result, the lungs having lost their contractility after so long a period of compression, while the functions of the neighboring organs are impaired by the long duration of their displacement.

There are, in fact, no contraindications for the radical operation. Even in the exceptional and inexcusable cases of long standing, where the patient may be cyanotic and very weak, with a small and frequent pulse, a preliminary aspiration may be done to relieve the patient, and resection should be performed on the following day.

In 1882 I advised resection of a piece of a rib in all cases, no matter how desperate they appeared, and I have found no occasion since to deviate from this principle. I have seen cures even in cases to the operation of which I had proceeded without a gleam of hope, this showing how easily we may err in our prognosis. Even in such desperate cases where the tarrying policy had caused amyloid degeneration of the liver, ascites, etc., entire restoration to health has sometimes followed resection treatment. Amyloid degeneration on this basis must not be regarded a hopeless condition, especially in children.

In tuberculous cases repeated cures have been effected, and my statements about the advisability of the resection treatment in such cases have been corroborated by Schede and Güterbock, and later by Küster, Rydygier, Hofmohl, Th. Weber, and Koranyi, who all reported a not inconsiderable number of cures. Regarding the absolute hopelessness of this type of the disease if left alone or treated medically, even a much smaller

percentage of cures, as reported, would urgently indicate the resection treatment. It would also be of incalculable benefit if such patients were operated upon much earlier. The chances being then much more favorable, the number of cures would be considerably augmented.

While primary miliary tuberculosis as well as pyothorax, caused by the perforation of a tubercular cavern into the pleura, gives a very poor prognosis, those cases in which the pleura has been infected from tubercular lungs show a considerable percentage of cures. Mixed infection is generally present in cases of this variety, the pneumococcus, staphylococcus, and streptococcus being also found.

As discussed in the section on etiology and bacteriological examination, the tubercle bacillus was not found in the pyothoracic effusion of a considerable number of these cases, in which, nevertheless, the presence of tuberculosis could be well proven by other than bacteriological means of investigation. In other words, the absence of the tubercle bacillus does not at all prove the absence of tubercular disease. As long as our diagnostic means in this direction are not more reliable, the surgeon will always be on the safe side by operating upon every pus-accumulation in the pleural sac, whether tubercular or not.

Whether exposure to the atmosphere is a healing factor in this connection, like the opening of the peritoneal cavity, can only be conjectured.

Those of my cases in which malodorous pus was found at the time of the operation invariably died. In all of them other grave processes were present,—either tuberculosis or multiple pyæmic foci. Some of these cases I have observed after grave gastro-enteritis in children. In some of them tuberculosis pulmonum was present, and perforation of a cavity into the pleural sac was suspected. In such cases we see an attempt of the *vis medicatrix naturæ*, which was defeated by the virulent infection.

If infectious diseases are the precursors the prognosis is much more favorable, particularly so after measles and influenza. The same view applies to trauma. Somewhat less favorable is the prognosis after the perforation of a subphrenic abscess.

As already stated in the section on etiology and bacteriological examination, those cases of pyothorax in which the pneumococcus is found show the most benign character of all. They are the most prevalent in children. Whether this is due to the particular character of the coccus itself is doubtful. It seems, as alluded to before, that the vitality of the organs and the pliancy of the thoracic walls in childhood are the main factors of this more benign tendency.

Accidents.—There are many reports on accidents which have occurred during anæsthesia. But if the principles emphasized in the section on operative treatment are obeyed, accidents from anæsthesia can hardly occur during the operation itself. I have, however, not infrequently heard of suddenly fatal cases in which the anæsthesia was left to beginners, who, in their ignorance, gave the anæsthetic too freely. While it is certainly most

agreeable for the surgeon not to be disturbed by the insufficient anæsthesia of the patient, it is wrong to subject the patient to any greater risk of life than is absolutely necessary. I know of several cases in this city where the patient died under the anæsthetic before the surgeon in charge had an opportunity to perform an operation on the chest wall. What the legal aspect of such occurrences is every surgeon knows.

Still it is surprising that such accidents do not occur more frequently in patients who suffer from large effusions which compress one lung totally and the other at least partially, and where, furthermore, the heart is displaced and the circulation in the large blood-vessels impaired. It is less cruel to trouble the patient and to save his life than to give him the so-called benefit of a full anæsthesia and to risk his life under the pretext of humanity. A limited anæsthesia frequently leaves an impression only, and not a clear perception of all the surgical procedures; and frequently it is the nervous dread of these procedures, and not the physical pain itself, which terrifies the most courageous patient. The odor alone of an anæsthetic will sometimes give the patient the agreeable impression of being insensible to pain.

Nor is irrigation by any means void of danger, even if sterile water only be employed. It is, therefore, a decided advantage of the resection-treatment that this does not require this dangerous and annoying manipulation. Dangerous conditions are especially provoked if the irrigating fluid be driven into a bronchus, when a communication exists. Violent cough paroxysms of long duration are generally observed under such circumstances, the patient sometimes succumbing during such a paroxysm.

Sudden collapse has repeatedly followed a too rapid and too forcible infusion, or a too rapid evacuation of the irrigation fluid. (Compare section on operative treatment.)

Rubber drainage-tubes have always been a great source of trouble to me. The mode of resection-treatment that I advise dispenses altogether with this *crua medicorum*.

During a period of fifteen years I have been called seven times to extract drainage-tubes which were imperfectly secured (as by one safety-pin only), or where the rubber was of an inferior quality, so that breakage occurred. Twice I have removed drainage-tubes, one being nine and the other eleven inches long, more than one year after operations by Buelau's method. There existed a strong predilection among physicians for very long drainage-tubes, on the assumption that the longer they are the better they drain the cavity. This is an error. Long tubes are nothing less than an obstacle to the expansion of the lungs, and do not drain off any more than short ones which reach only the internal opening of the cavity.

In stitching the costal pleura to the skin a strong needle should be used, preferably a Hagedorn needle. It has occurred that in stitching the pleura to the skin the needle has broken and dropped into the pleural cavity, wherefrom it could be extracted only with great difficulty and danger.

Criticisms of the Different Methods.—The methods considered nowadays in the treatment of pyothorax are simple aspiration, permanent aspiration (Buelau's method), incision, and resection.

A discussion of the value of the so-called "expectant treatment" will hardly be expected in a surgical article. Still there is no doubt that the *vis medicatrix naturæ* is frequently triumphant where either diagnostic ignorance or obstinate aversion to surgical procedures dictates therapeutic nihilism. There are cases of pyothorax which heal by perforation into a bronchus or by absorption, the latter process especially having been observed when the pneumococcus was found. As such occurrences are extremely rare in comparison with the enormously large number of the victims of delay, and as we do not at all know the conditions under which such exceptional cures are effected, such hazardous expectations may well be called even criminal. It is true that cases sometimes recover not because of but in spite of the treatment. But can a rule be deduced therefrom? And does not the exception confirm the rule? Furthermore, if really such absorption takes place, the question is raised whether this be really a fortunate event for the patient, as clinical experience shows that whenever absorption of pus takes place during a considerable length of time, a disposition to tuberculosis may be induced.

A perforation into a bronchus might just as well cause suffocation. Another mode of the *vis medicatrix naturæ* deserves mentioning,—namely, the so-called *empyema necessitatis*,—that is, a pus-collection in the pleural cavity which perforates through the chest wall. But of this it may be said, that it would, as a rule, represent nothing but an attempt of nature to heal, and, as a rule, not a successful one inasmuch as drainage is entirely insufficient. Consequently most patients in whom this "fortunate accident" happens succumb later to the consequences of pus-retention, unless a free opening be finally made.

R. K. Pel (*Zeitschrift für klinische Medicin*, p. 211, Berlin, 1890) says that the principle *ubi pus, ibi evacua* has justifiable exceptions, and that if empyemata be of small size, if the general condition of the patient be excellent, the pulse slow and full, fever absent, and the appetite good, absorption through thickening can be expected. But in such cases the correctness of the diagnosis seems to me to be more than doubtful, as no exploratory punctures were tried.

If such nihilism is based upon an exclusive consideration of pathology, it deserves more attention than if it be simply the outcome of ignorance. Nevertheless it does the patient the same amount of harm. Medicine is not only a science, but first of all it should be a practical art, of which pathology is certainly the basis, but still only a part of the entity. Only when the two factors, science and art, go hand in hand, does the patient obtain that amount of benefit to which he is entitled.

Simple aspiration is done by a trocar, to which such attachments are made that no air can enter the pleural cavity while the instrument is *in situ*.

Many different kinds of apparatus are thus contrived, some of them, like that of Dieulafoy, being very complicated and expensive. Whether the entering of the air into the pleural cavity, however, is really such a dangerous occurrence as is generally supposed, is not sufficiently proven. It seems to me that most of the accidents following simple aspiration are due to non-observance of aseptic precautions, to which careless operators are so much inclined.

As to the therapeutic value of simple aspiration in pyothorax, I can myself testify to the fact that perfect cures have been effected by this method, particularly in children, in whom the benign pneumococcus is so frequent. (Compare section on etiology and bacteriological examination.) Such cures are repeatedly reported. But these few cures are nothing in comparison to the immense number of those who have died under the aspiration-treatment. I will refer only to Dupuytren's experience in aspiration (see section on history). Of the large number of my own uncomplicated cases which submitted to early resection, I have lost not a single one, but it has frequently occurred to me that in the cases which were repeatedly aspirated, but unsuccessfully, and in which as a last resort resection was practised, the procedure was too late.

As before stated, in seventy per cent. of my cases solid masses were found in the pus-cavity. These could certainly not be aspirated. Now, if any of our diagnostic means could enable us to know whether such masses were or were not present, it might appear more justifiable to recommend free opening only in cases where solid masses are present and to try aspiration when they were absent. But as long as we possess neither physical, mechanical, nor speculative means to make this differentiation otherwise than by making a free opening, we have to choose the method which guarantees removal of the solid masses; and if a case which would have recovered by simple aspiration should undergo the more radical procedure of free opening, it will certainly not succumb, but will get well just the same.

Albert very well says, in reference to aspiration, "This procedure is analogous to the pumping out of other abscesses, as, for instance, suppurating buboes. In such cases a variety of aspiratory instruments have been tried, and once in a while a cure was effected. The only courageous and clear treatment is the broad opening."

This half-hearted surgery is analogous to the well-known surgery of emancipated midwives. Aspiration is evidently a very easy procedure; it is, in fact, "no operation," and the most unskilful surgeon can do it. So it finds its most enthusiastic advocates among the large contingent of the would-be operators who are so self-confident that they "never require the advice of a surgeon." They are generally the same who see all their cases of appendicitis recover without being "fooled by the surgeon." When they aspirate, they draw as much pus as they can; the patient is then greatly relieved, and so enthusiastic in praising this most agreeable way of

being operated upon that it would be simply impossible for a surgeon to persuade him to such a "mutilating operation" as free opening. If the pus accumulates again, the patient gladly submits to a second and also to a third or fourth aspiration, because "a stab with a needle is no operation." But the solid masses in the pleural cavity cannot be driven through the calibre of the aspirating needle, nor will they be absorbed. So the aspiration is repeated until much precious time is wasted, the patient becoming emaciated and the lungs contracted. Then, as a last resort, a free opening is made, which at this late stage is often not able to prevent the *exitus lethalis*. From such occurrences the aspiratory enthusiast deduces of course that free opening, particularly the resection-treatment, yields a bad prognosis, and that he, at least, "never saw a good result from it," which I certainly believe. I trust, however, that all these surgical imitators would give up aspiration could they once see the solid masses in the pleural cavity. But unfortunately they never see an opened thoracic cavity, at least not at the early stage of pyothorax, and so they naturally conclude that such masses do not exist.

Aspiration, however, is by no means always an innocent manipulation nor void of danger. The irritation in the pleural cavity may produce epileptic spells, vertigo, nausea, fainting, and even fatal collapse. At the same time a nervous surgeon may interfere with the intercostal artery. According to reports, death has repeatedly occurred through extensive hemorrhage from this source.

It may be emphasized, in conclusion, that aspiration should be reserved exclusively for exploratory purposes, for the cure of so-called serous effusions, and for temporary relief in exceptional cases, as described in the section on operative treatment. In the latter variety, however, where patients are extremely exhausted, resort should preferably be taken to aspiration combined with drainage (Buelau's method).

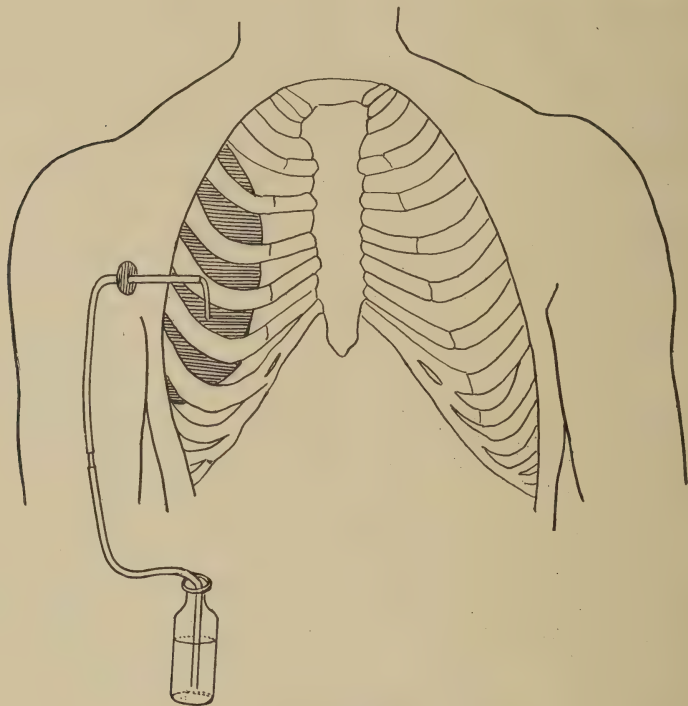
As to the definition of serous effusion, I may say that I call those effusions serous which, although they may contain a small amount of pus-cocci, still show the light color and the characteristic consistency; while pus represents a yellow, thick, homogeneous fluid. In practice the differentiation should only be made macroscopically.

In 1879 Baelz advised the combination of aspiration with irrigation. The wish was father of the thought, and it was certainly a splendid idea to try to wash out the solid particles from the pleural cavity. But these masses are unfortunately of too large size to be forced through the canula of a trocar, so that this method, which was received with great enthusiasm, dropped into deserved disuse.

Permanent Drainage.—The so-called Buelau's or suction method (Fig. 7) deserves attention. It is far superior to simple aspiration in that it aims to prevent refilling of the pus after aspiration. The technique of this method consists in introducing through the intercostal space a large trocar, from which the stylet is withdrawn and only the canula remains.

After a rubber drainage-tube is pushed forward through the canula into the pleural sac the canula is removed. The tube, which must remain *in situ*, is then fastened to the skin with adhesive plaster and connected by a glass canula with a long rubber tube. The rubber tube ends in a glass vessel filled with bichloride of mercury, where it is kept by attaching a piece of lead to its end. The glass vessel may be represented by a bottle,

FIG. 7.



Suction drainage.

which the patient can carry around in his waist-pocket. The advocates of this method claim that a permanent evacuation proportional to the expansion of the lungs is thus achieved.

Brilliant, however, as this method appears on a superficial contemplation, it has many and great disadvantages. First of all, the same objection as against simple aspiration must be raised,—namely, that the solid masses cannot be removed by suction any better than by simple aspiration. Even the advocates of this method admit that the drain is oftentimes obstructed by fibrinous coagula. Fever is nearly always present, on account of retention of pus. It is but a small consolation that, by the introduction of instruments and frequent irrigations, this perpetual obstruction can be removed, and that in the course of time the solid masses become liquefied.

Another very disagreeable feature of this method is that the drainage-tube comes loose in the wound canal, which will finally suppurate, and then, of course, the seclusion from the air is no longer hermetic. Even

as strong an advocate of this method as Aust (*Münchener medicinische Wochenschrift*, 1892, No. 45) complains that pus which was free of odor at the time of the operation repeatedly became septic in the later course of the treatment. When the adhesive plaster becomes loose the drainage-tube is apt to drop into the cavity, and the only way to remove it thence is by free opening. I have seen four cases in which such accidents happened after Buelau's method was used; but, as they necessitated resection, I am not sure, after all, whether the accident was not fortunate for the patient.

It is furthermore to be remembered that all such patients require much more careful watching than those under radical treatment. In fact, the control must be so close that it can be well carried out only in a hospital, and therefore the method is not very practicable in private practice.

In cases where the intercostal space is narrower than usual, a small drainage-tube can sometimes be introduced only with difficulty and after much annoyance to the patient; so, as already stated, Buelau's method should be reserved for very emaciated patients, and then used only as a temporary resort. It is significant that the advocates of this method are all internists.

Simple incision through the intercostal space has still many advocates who claim that a small incision which permits of the introduction of a small-sized drainage-tube fully answers the purpose of evacuation and of drainage. It is also claimed that any general practitioner could make the incision; while resection is regarded as a difficult operation, which would require the well-trained hands of a surgical specialist. Resection should be reserved, therefore, as a last resort only in cases where, after several months of unsuccessful treatment after the incision method, the ribs have approached each other to such a degree as to render the drainage imaginary.

As regards the advice to make a small opening into an abscess, I may say that, according to commonly accepted principles, it is not expected that a small opening in an abscess will secure thorough drainage and evacuation. Modern surgery prescribes that the opening should be made as broad as possible. It is intended to expose the abscess cavity so much, indeed, that not only can it be inspected thoroughly in its whole extent, but that its walls can also be palpated, and that its lining membrane as well as necrotic tissue (the latter often being present in abscess cavities) can be removed. It is only after such rigorous procedures that the modern surgeon is satisfied that the evacuation is thorough. The wound discharge will be scant and will be found in the gauze introduced into the cavity. No retention is expected, and, as a natural sequence, a perfect and quick recovery is to be looked for. It would not, nowadays, be expected that a surgeon should "lance" an abscess anywhere else, or introduce a small drainage-tube, the use of which would also imply the necessity of daily irrigations. But why should a pyothoracic cavity be treated on different principles from other abscesses?

After simple incision the field of operation cannot be inspected at all. Only if the intercostal space is very wide, which is never the case in children and seldom in adults, the surgeon's finger can be introduced; and if the opening permits of this, the finger is greatly restricted in its exploratory motions, and only small solid masses can be removed. Large masses will remain. Adherent clots cannot be detached from the pleura, nor can very large masses of them be reduced inside of the cavity, thereby making it possible to wash them out by a subsequent irrigation. So these masses have to undergo decomposition, and are dissolved or liquefied under constant febrile elevations, retention of pus of course always being present, when, at last, they may be washed out, provided the patient holds out so long.

As regards the alleged difficulty of resection, I am confident that the physician performs many a more difficult operation than that of rib-resection. If he desires earnestly to learn its technique, operating once on a lower animal will enable him to do it properly. Interference with the intercostal artery happens much more frequently in simple incision than in resection on account of the situation of the artery below the inner surface of the rib. In resection the incision is made only as far as the periosteum. So far there are no vessels of any importance. Then the further procedures can be carried out with blunt instruments. The tissues in which the artery is embedded are pushed aside so that it can be easily seen and avoided. If such an accident occurs after incision resection has to be made at once, but if the operator is very nervous the patient may bleed to death before it is completed. But if such an accident should really happen after the resection of the rib, which can hardly be imagined as possible, the artery can be caught without any trouble. Fatal hemorrhage from the intercostal artery after incision is reported from several clinics (Billroth).

If, as before suggested, the ribs move together after simple incision, further introduction, even of a small drainage-tube, becomes impossible. This condition prevails in the majority of cases. In fact, it represents a type of the almighty *vis medicatrix naturæ*, the effort of nature to diminish the extent of the cavity. But, unfortunately, the intended remedy in this case is nothing but a prevention of the cure, because it obstructs the opening.

As mentioned before, I have during the last two years dispensed with the drainage-tube entirely. Formerly I used to introduce a rubber drainage-tube of the size of a man's index-finger three days after resection. The tube was secured by two large safety-pins adjusted through the wall of the tube in the shape of a cross. The reason why I advised not to introduce the drain immediately after operation was that I had not only witnessed considerable hemorrhage after it, but also observed considerable irritation by friction, this being caused by the constant respiratory movements of the pleuræ. It seemed to me that as soon as granulations appeared, the pleuræ also becoming accustomed to contact with the atmosphere, the irritation

was well borne. Two weeks after operation, on an average, a smaller drain was introduced and gradually shortened. When the discharges became scanty the drainage-tube was left out and a small strip of iodoform gauze was substituted. For the following few days the patient was watched very carefully. It happened frequently that the cavity was entirely obliterated on the following day, but often union was only superficial, and retention of pus occurred, always indicated by an elevation of temperature. Then, of course, the drainage-tube had to be reintroduced, and after a week the same manœuvre was repeated until, several days after the obliteration, no discharge showed and the temperature had remained normal. Sometimes the presence of pus was revealed after a grooved director was forced through the scar tissue. The position of the patient had also to be changed every few hours, so as to make the pus flow into the dressing, thus trying to avoid stagnation of pus. The great danger of stagnation induced Küster to recommend counter openings on the opposite side of the original opening. All these annoying manipulations are rendered unnecessary if the cavity is packed with gauze.

The disadvantages of the drainage-tube in general are, in the first place, that no antiseptic influence will be exercised upon the wound or the cavity itself; but when, in a wound, the antiseptic gauze covers the outer ends of the tubes, it prevents decomposition of the wound products only after they have left the tubes and have entered the gauze, so that the absorbent qualities of the gauze, which are of such great value, are not utilized. If a cavity be packed thoroughly with gauze every particle of discharge must be absorbed, and, however large the cavity, *the pus will be in the gauze only* and the wound surface cannot be otherwise than dry. At the same time the antiseptic, with which the gauze is impregnated, exerts its permanent influence directly.

A drainage-tube does not withdraw or absorb pus, for it has no power to aspirate the pus, which merely traverses the tube, its lumen being the point of least resistance. But the flow through the tube occurs only *when pus is abundant*, which is the first step to its retention.

In conclusion, I feel justified in claiming that the resection method in connection with subsequent gauze treatment is, in contradistinction from all the other methods described, a clean, easy, safe, and nearly bloodless operation. It guarantees a large opening for a sufficient length of time, and makes subsequent operations unnecessary. Thoracic fistula in particular is impossible if the method be carried out at the proper time. The resected piece, if the periosteum has been preserved, is always restored, as can be demonstrated by palpation as well as by the Röntgen rays.

Statistics.—My own statistics embrace two hundred and thirty-one cases, observed during a period of fifteen years in the city of New York. After deducting the twenty-four cases published more than ten years ago (*Neu Yorker medicinische Presse*, December, 1886), two hundred and six remain in this series. Among them were sixty-eight below three years;

sixty-one were between three and five years ; thirty-seven were between five and ten years ; nineteen were between ten and sixteen years, and twenty-nine above this age. Among them nineteen died. Ten of them were children below five years ; of the others, two were between five and sixteen years, and seven above that age.

Among the non-complicated cases, where inflammatory processes in the lungs or pleuræ had been the precursors, one hundred and ten were diagnosed at an early stage. All these cases recovered. In fifty-six cases the operation was done at a late stage, nine of them showing the typical vaulting of the thorax. In five a fistula remained. Three of these cases ended fatally from amyloid degeneration. In one of these cases the fatal end occurred sixteen months, in the second case twenty-one months, and in the third case three years after the operation ; in all of them Simon's (the so-called Estlander's) operation had been tried. In the latter case seven ribs were resected.

As I have already noted, if only the non-complicated cases, in which resection was performed early, were considered, the mortality-rate would be practically *nil*. But as I have made it a rule to perform the radical operation even under the most desperate circumstances, the mortality-rate is unfavorably influenced. Nevertheless, a series of cases recovered the chances of which were formerly regarded as quite hopeless.

Among them I may enumerate seven cases in which malodorous pus was present (so-called stinking empyema). Five of them were infants ; in three of them grave gastro-enteritis was the precursor. In one case, a child of eighteen months, gastro-enteritis had been present two weeks before the signs of pyothorax developed. The considerable fever which was there in the beginning had nearly subsided, but there were always very rapid pulse and great weakness, a circumstance which points to the constant absorption of infectious elements. In one case, where diphtheria was the precursor, pyæmic foci were present. No antitoxin was given in this case.

In the other four fatal cases (one was a mixed infection) the presence of tuberculosis was proven by bacteriological examination. In three cases of well-developed tuberculosis the result was also fatal, in all of them the exitus occurring from three to eight weeks after resection.

In three cases of tuberculosis, where the diagnosis was corroborated by inoculation experiments, perfect recovery took place.

Statistics may easily mislead. If, as in some clinics, only the favorable cases are operated upon, the statistics will be accordingly favorable.

Schede reported seven deaths among eighty-six cases. In five of the latter grave septicæmia, pyæmia, and progressing gangrene of the lungs had been present. Of the other two one was due to sudden collapse after operation, and this accident could, according to Schede's own statement, have been avoided under different circumstances, dependent upon the surgeon. In the other case, a child of seven months, broncho-pneumonia was present on the other side when resection was performed. This properly

reduces the number of deaths to two or perhaps to one only,—in other words, to a mortality of not more than two and four-tenths per cent., or a percentage of ninety-seven and six-tenths of perfect and definite cures.

Glaeser ("Resectio costarum contra Heberdrainage bei Behandlung der Pleuraempyeme," Hamburg, 1890) reports twenty-one perfect cures in cases which were highly complicated. In all of them Glaeser had first tried Buelau's method unsuccessfully, performing resection only after the suction drainage had been kept up for seven weeks.

König, among seventy-six cases, lost ten after resection, the latter all being complications of the gravest character. (F. König, "Die Erfolge der Behandlung eitriger Ergüsse der Brusthöhle," *Berliner klinische Wochenschrift*, 1891, No. 10.)

Among forty-four cases of pyothorax J. Raczynski (Krakau) saw all those of metapneumonic origin recover after resection.

Among eleven cases of tuberculous pyothorax resected by Krönlein, four recovered perfectly, four died, and three were improved.

Perfect recovery took place in five of my cases of amyloid degeneration. These were old cases.

Some of the advocates of Buelau's method admit, however, the occurrence of many failures. Pel, for instance (P. K. Pel, "Bemerkungen über die Behandlung der Pleuraempyeme," *Zeitschrift für klinische Medicin*, 17, Bd. 199), and Quinke report many failures besides their successful cases.

Even Leyden (Leyden, "Ueber einen Fall von retroperitonealen Abscess nebst Bemerkungen zur Therapie der Pleuraempyeme," *Berliner klinische Wochenschrift*, 1889, No. 29) reports four cases of which only one was cured by Buelau's method, while another one was cured by resection performed later. The third case died from tuberculosis without being resected; and the fourth one died also, after having been resected at a very late stage.

Old Cases.—At the ninth congress of internal medicine, Ewald, seconded by Ziemssen, one of the greatest internists alive, made the potent declaration that "old cases of pyothorax should not exist, and when they do, the attending physician should be held responsible for their existence." While I heartily endorse this principle, still the fact that during the last three years I have had to perform very extensive operations in eleven cases of old pyothorax, shows that the golden age has not yet returned to us when the surgeons knew of such old cases only by hearsay. As long as the fable of the spontaneous healing of pyothorax still haunts reputable text-books on internal medicine, the realization of such an ideal state of affairs cannot be expected.

From a surgical point of view there is one pleasant feature about old cases of pyothorax,—namely, that while opinions on the surgical treatment of the acute form differ remarkably, there is unanimous agreement as to the principles of treatment in old cases. Hardly any surgeon, indeed, now expects good results from any other than the most radical operative steps.

As mentioned in the section on the history of pyothorax, Simon advised resecting several ribs to permit the collapse of the chest wall, in order to promote the healing process by approximating the costal and pulmonic surfaces of the pleuræ. But as the lungs do not approach the chest wall, the chest wall must be compelled to approach the lungs. If the ribs move closely together, thereby diminishing the size of the chest cavity, and if the shrinking of the costal pleura at the same time suffices to cause the movable neighboring organs to approach the chest wall, thereby filling up the cavity, the operation will be a success. But in most cases, particularly in older individuals, and if the cavity be very large, a fatal outcome cannot be prevented on account of the permanent suppuration.

In my last publication on this subject I deplored the poor results I had with this operation (the so-called Estlander's), only two cases recovering among five, and three succumbing; while in one of the successful cases I had to exsect pleural tissue later, so that even this one case is rather a credit to Schede's method. The reasons of the imperfect results are obvious. In the course of time the costal pleura becomes so much thickened that at last it forms a lining that is quite as strong and immovable as a bony one, and consequently is as great an obstacle to the approximation of the unexpanded lungs as are the ribs themselves. Such an immovable wall has, in consequence, to share the same fate,—namely, removal.

Since operating according to these principles my results are far better than formerly. Among eleven cases on which I have performed such extensive operations for old pyothorax, I lost only two.

As already stated, great credit is due to Max Schede for having first established these views in surgery. He proceeded, in fact, so radically sometimes, that he resected not only all the ribs of one side, but also the soft tissues in their totality, leaving only skin and scapula. It is evident that a mere skin-flap can easily be adapted to the pulmonic pleura.

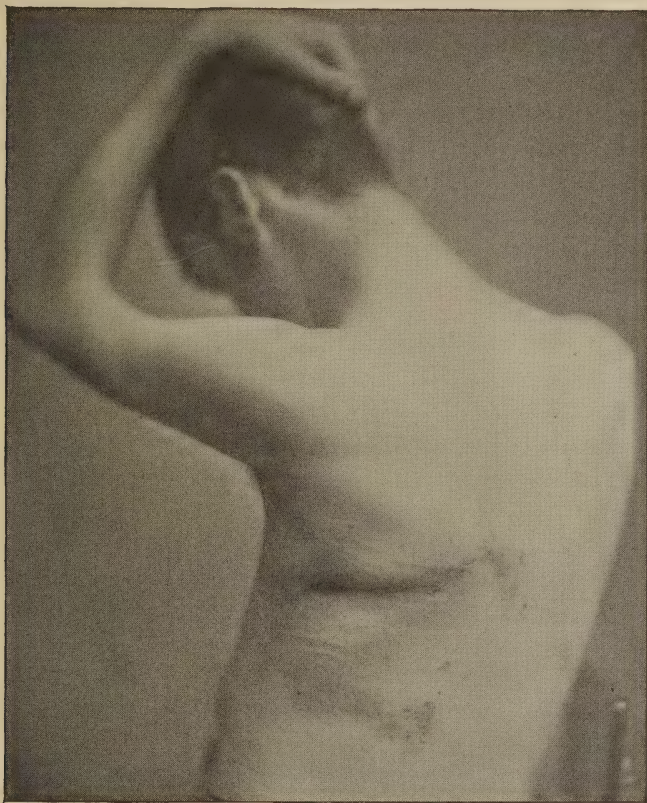
The technique, as advised by Schede, is the following: On a level with the fourth rib and from the external margin of the pectoralis major muscle a bow-shaped incision is made downward to the tenth rib in the posterior axillary line, there being the lowest portion of the pleural cavity. Thence the incision is conducted upward again in a similar bow-shaped line to the median side of the scapula. Thus a large flap in the form of a horseshoe is secured. The incisions are made directly upon the ribs. After the scapula and the subscapular muscle are loosened from their under layer, all the ribs that cover the cavity are resected subperiosteally. Then, with a strong Cooper's scissors, the pleural swards and the interosseous tissues are also resected. The intercostal arteries are compressed by an assistant before being cut through. Then they are caught at once and enclosed by inserting a suture around them.

If the patient be exhausted, it is not necessary to complete the whole operation at once. It is advisable, then, to be contented with the resection of a few ribs and to postpone the resection of the balance until the patient

has improved. The cavity must be covered thoroughly with the skin-flap, and the wound edges united anteriorly, while the posterior area is left open to permit of the introduction of iodoform gauze.

The greatest difficulty arises always in the upper part of the cavity, thorough exposure of its area being very difficult. If necessary, the first rib must be resected,—a difficult procedure, which is best preceded by a temporary resection of the clavicle. Such extensive operations, however, are required only in adults.

FIG. 8.



Long incision for extensive resection.

In some of my old cases I have closely followed Schede's technique. I found it more advisable, however, not to invariably outline to any definite typical plan. I also gave up the horseshoe-shaped flap, and when necessary I did not hesitate to remove portions of the scapula. After selecting the rib which apparently forms the centre of the cavity ceiling, I make my incision-line alongside this rib, exactly in the same manner as described in the section on operative treatment, the only difference being that the incision is much longer. Then a long piece is removed, if the cavity be of great extent, in its whole length. Now the cavity is well exposed, and the further steps can be outlined. Usually the next lower and the next upper

ribs, together with the costal pleura, are resected in the manner described (see Illustration No. 8). In most old cases this suffices; but in cases of considerable extent I add vertical incisions, rectangular to the original one; generally one such incision, made either in the upper or the lower direction, according to the situation of the cavity, suffices in such cases; as a rule, one vertical incision is conducted up to the inner margin of the scapula. By dissecting the margin of the additional incision backward two triangular flaps are formed, which are to be retracted with strong tenacula. Thus the whole rib-roof can be exposed. Whenever possible, I try to save the muscular tissue and dissect away only the pleural swards.

If symptoms of collapse supervene during the operation, I stop, deferring further resection to a later period. Sometimes I have repeated the resections. I have gained the conviction that even the most extensive resection does not always guarantee a perfect recovery, and that on account of the irregular conditions of expansion, correcting operations have sometimes to be performed at a later period. *Vice versa*, a resection of small extent, removing just the thick central portion of the costal pleura and furnishing good drainage, is sufficient to heal up a cavity of large extent. It is, therefore, not advisable in the majority of cases to outline an extensive operation by forming an enormous horseshoe flap, but to choose a less extensive method from the beginning and to give this the necessary elongation later; the surgeon thus accommodating himself to the conditions as they turn up in the further course of the operation. If in exceptional cases the pulmonic pleura become so thickened as to obstruct the healing process, removal of its fibrous portions must also be performed. Anæsthesia is often difficult during the operation, and the rules laid down on incomplete anæsthesia in the section on operative treatment are to be strictly obeyed.

Some of the patients, after being cured, appear at first greatly mutilated. But it is surprising to see how they improve after the lungs become expanded, and with gymnastic exercise, particularly liberal motion of the arms, the depression as well as the scoliosis will disappear almost entirely. In my younger patients (compare Illustration No. 9) the spinal column is absolutely straight.

The ribs are nearly always restored, some of them, indeed, to a greater extent than is desirable. In one case (see Illustration No. 10, *b*) stalactite-like formations are noticeable; in others it can be seen that the ribs have lost their round, oval diameter and appear more like a broad wedge (see Illustration No. 10, *a*). Helferich explains such abnormal changes of the bone-tissue by absorptive processes induced by the irritation at the operation.

HISTORY OF CASES.

CASE I.—M. L., thirty years of age; laborer; born in New York City. Family history good. In November, 1892, he took sick with influenza. Four weeks later the presence of pyothorax was diagnosed. Evacuation of the pus was done by Buelau's method. After the patient had carried around his pus-bottle in one of his

boots for fifteen months he was admitted to the St. Mark's Hospital, where, on March 17, 1894, I found the patient in a greatly exhausted condition. In the right anterior axillary line, in the sixth intercostal space, I noticed a thin rubber drain connected by a glass tube with a long rubber tube, which led into a bottle filled with bichloride. The drain was loose in the canal. The third, fourth, and fifth ribs, with the proportional area of the costal pleura were resected. In the bottom of the cavity a rubber drain nearly one foot in length was found, which had undoubtedly dropped into the cavity unnoticed. How long it had stayed there could not be ascertained, as we concealed the fact from the patient, and could not therefore get information from him in this regard. Recovery was perfect three months after the operation. The scoliosis which was present in the beginning disappeared.

CASE II.—R. T., forty-nine years old; peddler; born in Hungary; twenty years in this country. Precursor, pleuro-pneumonia (right side). Incision four weeks after its onset; six months later resection, without benefit. On June 17, 1895, more than a year after the first operation I resected, at St. Mark's Hospital, the fourth, fifth, sixth, and seventh ribs, together with the proportional area of the costal pleura. Recovery was perfect four months thereafter.

CASE III.—F. S., housewife, thirty-five years old; born in this city. Precursor, influenza. Three weeks after the onset of the disease aspiration, which was repeated eleven times during a period of two months; then resection of a small piece of a rib was performed. On July 19, 1894, two years after the first aspiration, I resected all the ribs from the third down to the eighth, including the latter. The costal pleura was also removed accordingly. Considerable shock (?). Slow but perfect recovery took place, the healing process requiring five months. Several times scraping of the cavity was done. No curvature.

CASE IV.—J. L., seventeen years of age; office boy; born in New York City. Precursor, influenza. Simple incision (left side) five weeks after the onset of the disease. Nine months thereafter resection of a small piece of a rib. On December 19, 1894, when I saw the patient first, I found an enormous cavity, holding nearly one quart of fluid. I resected the ribs from the third one down to the eighth by making two parallel incisions alongside the fourth and the seventh ribs, from where the other ribs could be exposed. Recovery was perfect three months after the operation. No curvature.

CASE V.—L. R., fifty-six years old, housewife; born in Germany; thirty-four years in Brooklyn. Family history good. Precursor, pneumonia (left side). Aspiration four weeks after the onset of the disease. Incision one week later. Ten months thereafter, on February 2, 1895, I resected the fourth, fifth, sixth, and seventh ribs, together with the corresponding area of the costal pleura. The cavity held one pint of fluid. Recovery was perfect three months after the operation. No curvature.

CASE VI.—G. Z., housewife, thirty-eight years old; born in Germany; three years in New York City. Tubercular family history. Patient had pneumonia when a child. Has no children. Precursor, influenza. Incision five weeks after the onset of the disease. On August 27, 1894, fourteen months after the incision was made, I resected the fourth, fifth, and sixth ribs in their totality. The cavity held half a pint of fluid. Recovery was perfect two months after the operation. Very slight scoliosis.

CASE VII.—C. L., male, eighteen months old at the time of the last operation; born in New York City. Precursor, pleuro-pneumonia (right side). Simple thoracotomy four weeks after the onset of the disease. When I saw the very much emaciated patient on May 24, 1896, for the first time, six months after the thoracotomy was performed, I hesitated to resect, as the case seemed to be entirely hopeless. Still, acting on the principle that the patient had nothing to lose, I resected the fourth, fifth, and sixth ribs, the patient getting only a few drops of chloroform during

the whole operation. Recovery was perfect two months after the resection. No curvature.

CASE VIII.—Case presented to the German Medical Society of New York, October 5, 1896. H. B., tailor, twenty-one years old at the time of the last operation; born in Roumania; eleven years in this country. Was always well. Family history good. At the end of August, 1894, he was seized with pleuro-pneumonia. On September 9 thoracotomy was performed in a hospital of this city; whether a piece of rib was resected or not could not be ascertained. At the end of October, 1895, he was discharged from the hospital. Out-door treatment until beginning of March, 1895. A large cavity then existing, a prominent surgeon performed a so-called Estlander's operation, and, as far as could be ascertained, the seventh, eighth, ninth, and tenth ribs were resected. After having been treated in the hospital for another five months, the patient left uncured. On December 23, 1895, I performed resection of the third, fourth, and fifth ribs in their totality. At the same time I removed the stalactite-shaped formations from the stumps of the sixth and seventh ribs, which are shown in the lower portion of Fig. 10. In this case I made a horseshoe-shaped flap, as seen in Illustration 9. A Röntgen skiagraph, which was taken nine months after the last operation, shows granulating bone-tissue at the edges of the ribs last resected, and also shows that the lower ribs were entirely regenerated. The underlying costal pleura, the diameter of which was more than one inch at its thickest portion, was also removed. There was great difficulty in approaching the third rib, the scapula always being much in the way, although it was pulled rather forcibly over the thorax. The greater part of the enormous wound was sewed up, leaving only a posterior opening for the introduction of iodoform gauze. Uninterrupted recovery was perfect two months after the operation. The scoliosis which had been present disappeared entirely, the patient attending to his business and being normal in every respect.

CASE IX.—Case presented to the German Medical Society of New York, October 5, 1896. Th. N., born in England; in this country since May, 1896; twenty-four years old; clerk. Family history good. On March 2, 1895, he developed influenza (severe pleuro-pneumonia, left side). Five weeks later resection for pyothorax was performed in Preston, England. Twenty-five weeks later another resection was made, this time a much longer piece being excised; considerable improvement followed this second interference, but once retention of pus occurred later. (I am indebted to the kindness of Dr. D. W. Brown, of Preston, England, for a report of this case.) On September 19, 1896, when I first saw the patient in consultation with Dr. Tillinghast, of Norwich, Connecticut, I found him in a desperate condition, the pulse being very frequent, the temperature high, and the retention of pus enormous. Nephritis and cedema of the lower extremities were also present. Operation at St. Mark's Hospital, September 21, 1896. On account of the miserable pulse, only little chloroform was administered. Exploration revealed that the roof of the cavity was represented nearly entirely by the scapula and the fourth, fifth, and sixth ribs. After having made a horizontal incision alongside the fifth rib, I could resect the fourth and sixth. The costal pleura was removed proportionally. The patient recovered with surprising rapidity, and was able to walk about one week after the operation. Two weeks after the operation the albumen had entirely disappeared, and after two weeks more the arm could be lifted vertically. Recovery was perfect ten weeks after the operation. The fourth and fifth ribs were closely attached to each other by an abundant proliferation of bone tissue, leaving only a small hole between them, as is shown in Fig. 10, upper portion. This was undoubtedly the point where the former resection was made. Around the small rubber tube a large amount of callus-like tissue had grown. From this fact it can be learned that even in a primary resection for pyothorax a piece of sufficient length must be sacrificed.

FIG. 9.



Horseshoe-shaped scar.

FIG. 11.



Skiagraph showing resection of ribs on the left.

The Röntgen skiagraph, taken one week after operation (Fig. 11), shows to what extent the ribs were resected.

CASE X.—R. S., forty-four years old; bricklayer; born in Germany; ten years in New York City. Precursor, pneumonia (left side). Aspiration five weeks after

FIG. 10.



Upper portion, drain-hole in the centre; lower portion, stalactite-shaped formations on fragments previously resected.

the onset of the disease. During a period of two months aspiration was made eight times; then resection of a small piece of a rib was performed. More than one year later, on August 7, 1895, I resected the fourth, fifth, sixth, seventh, and eighth ribs in their totality. Death from exhaustion two weeks after.

CASE XI.—Miss C. L., twenty-four years old; born in Germany; fifteen years in this country; tubercular family history. Had pneumonia three times when a child. Precursor, influenza. Aspiration six weeks after the onset of the disease. Two weeks later, resection (left side). On March 13, 1894, I resected the fourth, fifth, sixth, and seventh ribs, with the proportional area of the costal pleura. Death from exhaustion four weeks thereafter.

In conclusion, I desire to report a case, operated upon by Billroth, because of its somewhat romantic history. The patient, now a man of thirty-eight years, acquired pyothorax, preceded by pneumonia, in 1879 in Austria. An incision was made, but perfect recovery did not take place, although the patient remained in the hospital fully four and a half years, during which period he claims that he was chloroformed sixteen times and that two hundred operations (!) were performed on him altogether. The patient undoubtedly means curettings. After he was told that his case was incurable he tried to commit suicide by throwing himself into the Danube River, but he was saved by a policeman, who, sympathizing with the poor sufferer, was kind enough to send him to Billroth's clinic at Vienna in 1883, where he became perfectly cured. The very large and deep scar (Il-

lustration No. 12) indicates that Billroth had resected the second, third, fourth, fifth, and sixth ribs from the sternum to the right median axillary line. The skiagraph (Fig. 13) shows very well the replacement of the resected ribs by new osseous tissue.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

J. A. SCOTT, A.M., M.D.,

AND

JOSEPH SAILER, M.D.,

Physician to the Out-Patient Department of
the Pennsylvania Hospital,

Associate in the Pepper Clinical Laboratory.

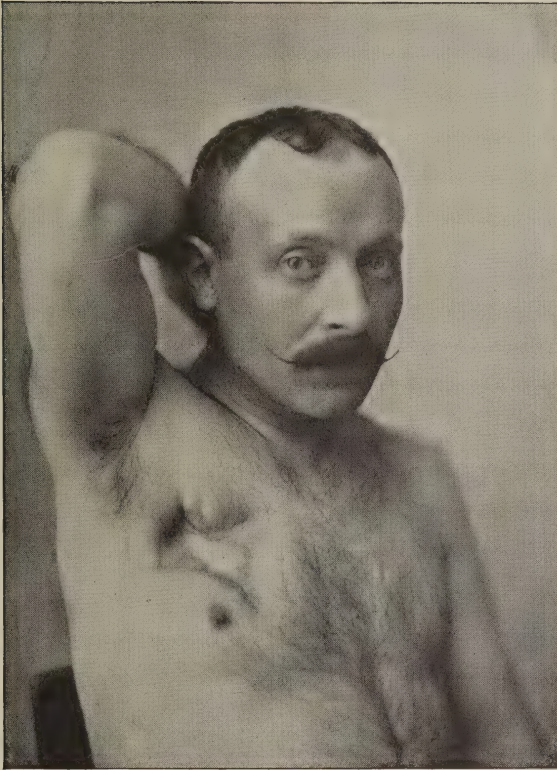
Investigations on the Application of the Phonendoscope of Bianchi. (*Münchener medicinische Wochenschrift*, November 10, 1896.)
By B. F. Egger, M.D.

After first stating a personal objection that sounds caused by rubbing parts of the instrument are conveyed to the ear with painful intensity, Egger reports an elaborate series of experiments that were suggested by the absence of metallic sound in certain intrathoracic sounds as heard through the phonendoscope. By these he determined that the instrument was incapable of transmitting sounds of greater vibratory rapidity than six thousand per minute, or even less. Tones of lower intensity were magnified. As a result, certain high-pitched heart-murmurs are absolutely inaudible, and amphoric breathing is imperfectly heard or converted into ordinary bronchial breathing. In conclusion, he calls attention to the fact that the attempt to outline the organs by rubbing is inaccurate, inasmuch as the change of note occurs at a certain distance from the staff without particular relation to the border of the organ, as can be proven by experiments on the thigh.

The Dietetic Value of Fat in Diabetes. (*Edinburgh Medical Journal*, November 18, 1896.) By James C. Dunlop, M.D.

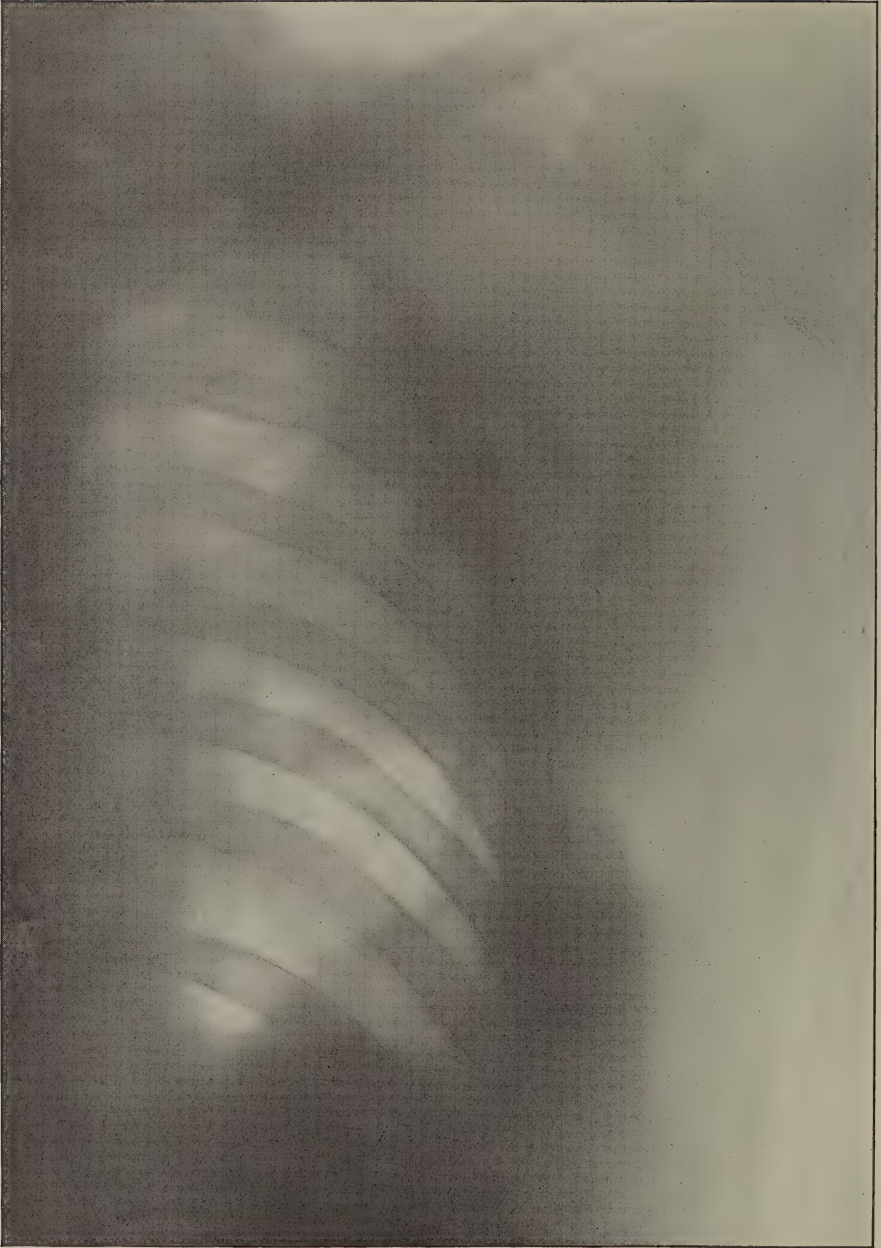
The patient, a man of fifty, with a daily excretion of from one hundred to two hundred and fifty grammes of sugar, was subjected to a rigid diet of skimmed milk containing 24.8 grammes N *per diem*. For two periods of three days this was given alone, and for two alternating periods of three days one hundred and seventy cubic centimetres of olive oil were added. The urine was tested for total N by Kjeldahl's methods, for preformed

FIG. 12.



Billroth's case.

FIG. 13.



Skiagraph of Billroth's case showing replacement of ribs by new osseous tissue.

NH₃ by Schlössinger's method, and for glucose by the polarimeter. The fæces were tested for total N, and on the sixth and twelfth days for oil. The averages were as follows: First and third periods (without oil), urine, quantity, 4891 cubic centimetres; total N, 21.8 grammes; preformed NH₃, 0.62; glucose, 174 grammes. Second and fourth periods (with oil), quantity, 5045 cubic centimetres; N, 23.4 grammes; NH₃, 48 grammes; glucose, 179 grammes. Fæces, respectively, N 0.38 and 0.44; oil, sixth day, 3.53; twelfth day, 8.01. The N balance was nearly perfect; the oil slightly increased the quantity of urine and of total N, and was itself almost entirely absorbed. The amount of glucose was not materially affected. The oil, however, was not converted into sugar, and must therefore either have been stored up for future use or else converted into energy, and in these ways it may be of considerable use.

IN the Verein für innere Medicin, Litten (*Berliner klinische Wochenschrift*, November 5, 1896) presented a case of cyanosis in which all the ordinary signs of congenital malformation of the heart were absent. He concluded, therefore, that there must be a transposition of the pulmonary artery and the aorta, and that sufficient oxygen to maintain life was absorbed by the blood in the bronchial vessels. Twenty-four cases of this condition have already been recorded. A. Fränkel disputed the assumption that physical signs are invariably present in case of congenital anomalies of the heart.

In the same meeting Bernhardt reported the case of a child of five years suffering with whooping-cough, that on the tenth day suddenly became paralyzed in both legs, and had some difficulty in evacuating the bladder. The knee-jerks were increased, the electrical reaction and nutrition of the muscles normal, and the sensation slightly diminished. At the end of four weeks some improvement was noticeable, that, with some remissions, continued until almost perfect recovery ensued. During the convalescence the condition on one occasion was rendered much worse by an attack of mumps. Regarding the causation of the symptoms, he suggested the possibility of hemorrhage into the cord, or some septic process or intoxication. In the discussion Heubner stated that such conditions can occur in whooping-cough without the occurrence of gross lesions, and Baginsky suggested that all the symptoms might be due to hysteria.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.
Philadelphia,

WILLIAM BROADDUS PRITCHARD, M.D.,
New York City,

AND

WM. G. SPILLER, M.D.,
Philadelphia.

Primary Muscular Dystrophy in Two Brothers. (*Medical Record*, November 7, 1896.) By Theodore Diller, M.D.

The hereditary feature of the muscular dystrophies strongly points to their being due to developmental defects; and this heredity, as has been pointed out, is one of the chief clinical characteristics of the muscular dystrophies. In these cases the parents are healthy. In both cases there was slow onset in childhood; atrophy affecting the shoulder girdle, upper arms, and thigh. In neither case was the face involved, and there were no fibrillar twitchings. In one of the cases there were marked contractures of the thighs and legs. This conformed to Erb's type. In the second case there was considerable hypertrophy of the calves, suggesting pseudo-muscular hypertrophy; lordosis, and waddling gait. There was marked atrophy of the upper arms and shoulder-girdle with apparent moderate hypertrophy of the deltoids and slight atrophy of the thighs. The latter case was therefore of mixed type.

Myelitis; a Case in which the Symptoms appeared several Weeks after the supposed Cause. (*Boston Medical and Surgical Journal*, November 5, 1896.) By S. G. Webber, M.D.

A man, aged sixty-eight, fell at a crossing and severely jarred the whole body. Twelve weeks later symptoms of myelitis set in, from which the patient steadily grew worse and finally died. There was no autopsy, but the author supposes that, although insignificant at its origin, the lesion was quite possibly due to a hemorrhage of the cord.

Concerning Pseudo-Spastic Paresis with Tremor following Trauma. (*Neurologisches Centralblatt*, Nos. 20 and 21, 1896.) By Dr. Nonne.

Fürstner has described two cases in 1896 with a symptom-complex which he has called "pseudo-spastic paresis with tremor." In his cases spasm and tremor of the muscles with some weakness, especially in the lower limbs, were noticed after trauma. The muscular tonus was modified by the mental state of the patient. The intensity of the tremor also varied. Fürstner believed the disease to be a functional neurosis. Nonne had previously, in 1896, published briefly several cases with this symptom-complex. In his present paper he gives the history of seven cases. With Fürstner's two cases there are now nine cases with this symptom-complex reported.

The cause of the disease is trauma, which usually chiefly affects the back. Frequently the patient complains at first of obstinate pains in the back and breast, which may persist as long as the disease lasts. None of Nonne's patients were hereditarily afflicted, none were syphilitic, none had taken much alcohol. The disease, according to Nonne, begins usually as follows:

Either at once or else some time after an accident a subjective weakness with tremor develops in the lower limbs after moderate exertion. The tremor involves all parts of the limbs and in certain cases the entire body. It may be so intense that standing becomes impossible. The muscles of the affected limbs tend to contract, and these contractures may be so severe as to cause pain. In mild cases during rest the muscles are relaxed and without tremor. They are not so, however, in severe cases. Observation and intentional movements increase the spasms and tremor. Real paresis does not exist, but there is a disproportion between the amount of muscular force and the development of the muscles. The gait is not characteristic of any known disease. Disturbances of sensation may be present or absent. Various symptoms of the neuroses may be observed. The pupils react normally.

The tendon reflexes in all of Nonne's cases were lively, but typical patella or foot clonus was not found, neither were the sphincters involved. There was no mental disturbance. The disease is essentially functional. Prognosis is bad. Only one of Nonne's cases recovered.

The Effects of Early Optic Atrophy upon the Course of Locomotor Ataxia. (*Medical Record*, November 14, 1896.) By Pearce Bailey, M.D.

It has been known that optic atrophy has a very decided influence on the development of tabes. Dr. Bailey states from his observation that—

1. In about seventy-five per cent. of the cases of tabes, in which optic atrophy is an early symptom, some of the other tabetic symptoms may be late in appearing or may not develop at all. This is especially the case in respect to the lightning pains and the incoördination of movement. The loss of knee-jerk in such cases is very constant.

2. The most distressing symptoms may develop simultaneously with or immediately succeed the blindness.

3. The association with the optic atrophy of oculomotor palsies is without prognostic significance.

The Cerebral Complications of Raynaud's Disease. (*American Journal of the Medical Sciences*, 1896.) By William Osler, M.D.

Dr. Osler writes on the complications of the central nervous system in Raynaud's disease. Perhaps the most frequently associated disorder is hysteria. Occasionally there are symptoms pointing to serious disturbances in the functions of the brain. Three cases are reported.

In Case I. the patient had hæmoglobinuria and attacks of epilepsy when the local symptoms of Raynaud's disease were present. The attacks occurred only in the winter.

In Case II. there were recurring attacks of aphasia with transient hemiplegia and dizziness. In the patient's final illness the right hand and fingers were completely gangrenous.

In Case III. painful swelling of the legs between the knees and ankles was noticed. The patient had attacks of falling without aura or convulsions, and probably without loss of consciousness. These may have been hysterical.

Facial Paralysis. (*Neurologisches Centralblatt*, November 21, 1896.)

By Toby Cohn, M.D.

Cohn describes a case of facial paralysis with deafness, which began acutely. The paralysis of the left side of the face occurred in a child of three years, and was accompanied by fever and convulsions. The cause was supposed by the attending physician to be inflammation of the brain. The convulsions were not repeated, but the facial paralysis persisted. Cohn thinks the cause may have been hemorrhage within the internal auditory meatus or else meningitis. He claims that this is the first case ever reported of unilateral facial paralysis with deafness occurring acutely and not resulting from trauma. The fact that certain of the facial muscles were not paralyzed in a lesion of the trunk of the seventh nerve is explained by the supposition that some of the fibres within the nerve escaped injury. Indeed, in lesions of the trunk of the seventh nerve the orbicularis oculi and orbicularis oris, more perhaps than other facial muscles, may remain intact, and it is not necessary to ascribe the cause to nuclear disease.

A Contribution to the Pathology of Epilepsy. A Report of Two Cases in which a Portion of the Brain Cortex was Excised and Examined. (*Brain*, 1896.) By Joseph Collins, M.D. Microscopical examination of the first case by A. Wiener, M.D.

The first patient reported had only had three epileptiform attacks before the operation was performed. These began in the fingers of the right hand and were associated once with loss of consciousness and biting of the tongue. There was no history of recent injury to the head of any import, although four or five years previously the patient had been thrown against a wall. The diagnosis of Jacksonian epilepsy was made, and, as there was absence of optic neuritis, headache, vomiting, etc., the cause was supposed to be meningo-encephalitis and not brain tumor. At the operation the dura appeared normal. A portion of the central convolutions, which previously on being irritated with the faradic current had given rise to contractions in the hand, was excised. Two pieces of cortical tissue each about the size of the terminal phalanx of the thumb were removed.

Within a week the paralytic symptoms produced by the operation had

become comparatively slight, but paralysis of sensation seemed to develop in the right index finger and thumb and considerable ataxia in the movements of the hand was noticed.

Somewhat more than a year after the operation, and very nearly a year after the last epileptic attack, the dynamometer in the right hand registered 30, in the left, 100. Myotatic irritability of the right upper extremity was increased. Muscular sense was somewhat diminished in the right hand and the sense of position was not perfect. The hand had a tendency to remain in a semiflexed position. There had been no mental deterioration and nothing that resembled an epileptic attack. Bromide of potassium had been given.

The cortical tissue was submitted to microscopical examination. The pia was found to be thickened and adherent and in some places had grown into the cortex. The neuroglia was increased in certain areas. The blood-vessels were distended and their walls were thickened and infiltrated with cells. Some of the vessels were occluded. Cellular infiltration and softening were also found within the cortex. Many of the ganglion-cells were altered.

In pieces of cortex removed from another case of epilepsy of the idiopathic focal type numerous hemorrhages, probably resulting from the operation, and altered large pyramidal cells were found.

The Surgical Treatment of Focal Epilepsy. (*American Journal of the Medical Sciences*, October, 1896.) By B. Sachs, M.D., and A. G. Gerster, M.D.

The authors report the results of their observations of nineteen cases of partial epilepsy. They include not only the cases of traumatic origin, but also those in which localized convulsions were associated with other diseases, especially with early infantile cerebral palsies. In only a single case could death be attributed directly to the operation. We are informed that the return of the attacks during the first few days following an operation by no means proves that the surgical procedure has been a failure. The paralysis produced by the excision of a diseased portion of the motor area was found to be merely transitory, probably because this area had ceded its functions to neighboring, healthy portions of the cortex.

They draw the following conclusions:

1. Surgical interference is advisable in those cases of partial epilepsy in which not more than one or, at the utmost, two years have elapsed since the traumatic injury or the beginning of the disease which has given rise to the convulsive seizures.
2. In cases of depression or other injury of the skull surgical interference is warranted even though a number of years have elapsed; but the prospect of recovery is brighter the shorter the period of time since the injury.
3. Simple trephining may prove sufficient in a number of cases, and

particularly in those in which there is an injury to the skull or in which a cystic condition is the main cause of the epilepsy.

4. Excision of cortical tissue is advisable if the epilepsy has lasted but a short time, and if the symptoms point to a strictly circumscribed focus of disease.

5. Since such cortical lesions are often of a microscopical character, excision should be practised even if the tissue appears to be perfectly normal at the time of operation; but the greatest caution should be exercised in order to make sure that the proper area is removed.

6. Surgical interference for the cure of epilepsy associated with infantile cerebral palsies may be attempted, particularly if too long an interval has not elapsed since the beginning of the palsy.

7. In cases of epilepsy of long standing, in which there is in all probability a widespread degeneration of the association-fibres, every surgical procedure is useless.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,

Paris, France.

The Prognosis of Ocular Tuberculosis. (*La Clinique ophtalmologique*, May, 1896.)—de Wecker, of Paris, has had the good fortune to remove so completely an area of tuberculous material from an iris in a five-year-old boy that seven years later the vision of the previously affected eye was normal and the patient's general health was good. He is opposed to enucleation in such cases because, in accordance with Leber's belief, he thinks that ocular tuberculosis is merely a very slight form of the dyscrasia and that it is readily removed. He believes that no one has authority to consider tuberculosis of the eye as primary, and that, in consequence, the supposed protective effect of enucleation is unscientific and hypothetical. Further, he says that removal of the eye in young subjects is a grave mutilation tending to produce marked facial asymmetry.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

A CASE OF CONTRIBUTORY NEGLIGENCE DEFEATING AN ACTION FOR ALLEGED MALPRACTICE.

(Concluded from page 738.)

"Against all this formidable array of testimony," says the Supreme Court, "there was not a single fact or opinion given in evidence. It was entirely uncontradicted. It was manifestly impossible to set up a dividing line at the time the plaintiff left the hospital and attempt to separate these consequences of alleged treatment of the defendant, which occurred prior to the plaintiff's leaving the hospital, from the ulterior consequences resulting from the plaintiff's contributory negligence after he left. It is impossible to set up a standard, because it is impossible to know what would have been the result of the defendant's treatment if the plaintiff had remained at the hospital."

The nurse did not distinctly say that she repeated to the plaintiff the defendant's answer,—namely, that if he left the hospital he did so on his own responsibility. She was not asked the distinct question whether she did or not. She did say that Dr. D. said these words to her, but omitted to say whether she repeated them to the plaintiff. "We think," says the Supreme Court, "the plaintiff must be held responsible for the consequences of omitting to have medical treatment after he left the hospital, and for his travel to W. and B. He did not advise with the defendant as to those matters, and he cannot hold the defendant responsible for his own voluntary acts in relation thereto."

And, continuing, the Supreme Court says,—

"After a painstaking, careful, and minute study of the testimony in this case we are constrained to say that we regard the verdict of the jury as an outrage upon the administration of justice. There was no aspect of the testimony upon which it could be justified for any such amount, in any event. The plaintiff's case, at the very best, was of the most doubtful character. No verdict could be sustained at all except by striking down the testimony of ten entirely competent, disinterested witnesses, and accepting in its place the testimony of two witnesses who, whatever may be their personal merits, did not possess a tithe of the experience or means of ob-

servation enjoyed by the defendant's witnesses. As to three of these men who personally saw and carefully and frequently examined the plaintiff's leg immediately after the accident, when it could be best observed and considered, their testimony was absolute and positive that there was no fracture. They were all disinterested, entirely capable, and, two of them at least, having very large experience in this class of cases, and there is no reason discoverable in the testimony why their judgment and their evidence should be rejected in order to give place to the opposing testimony of two of the plaintiff's witnesses, one of whom did not see the patient until eighteen days after the accident, and the other not until forty-eight days had elapsed. In the mean time the plaintiff's conduct and action were such that even a fracture might have supervened on that account, but the most experienced and competent of the defendant's witnesses were of opinion, and so testified, that every condition of the leg as seen by Dr. E. at B. could easily be accounted for by the conduct of the plaintiff after he left the hospital.

"On the subject of the plaintiff's contributory negligence in this regard there was no disputed testimony. It was established by all the evidence in the case, including that of the plaintiff's witness, Dr. E. No opinion of any witness was given to the contrary, and it was therefore an undisputed fact in the case. The learned court below very properly charged the jury that if the plaintiff's conduct was such, after leaving the hospital, as to contribute to his condition, he could not recover for such consequences as happened after he left the hospital. But the evidence being entirely undisputed on that subject, it must be regarded as establishing the fact of contributory negligence on the part of the plaintiff, and hence the case should have been withdrawn from the jury, in accordance with the defendant's contention that under the evidence the verdict should be for the defendant. The learned court below showed its appreciation of the verdict by promptly striking down two-thirds of its amount, and might with still greater propriety have set the verdict aside altogether because of its being against the law and the evidence and grossly excessive in amount."

As to the policy of encouraging suits of this character against such defendants, the Supreme Court goes on to say, "It must not be overlooked that the medical and surgical service rendered by the defendant to the plaintiff was entirely gratuitous, the defendant receiving no compensation of any kind. For many years Dr. D. had been rendering such service to the hospital to which the plaintiff was brought after receiving his injury. He was one of a corps of physicians who, from motives of benevolence and charity, contribute, as they do in many other cities and towns, their time, their skill, their labor, and their most valuable and humane service in relief of the sickness and suffering of their race. If such gentlemen are to be harassed with actions for damages when they do not happen to cure a patient and are to incur the hazard of having their estates swept away from them by the verdicts of irresponsible juries who, caring nothing for law, nothing for evidence, nothing for justice, nothing for the plain teachings of

common-sense, choose to gratify their prejudices or their passions by plundering their fellow-citizens in the forms of law, it may well be doubted whether our hospitals and other charitable institutions will be able to obtain the gratuitous and valuable service of these charitable and unselfish men. It is much more than probable that if this plaintiff had been content to remain at the hospital a week or two longer he would have been cured of his hurt. Because he would not submit to such a reasonable detention he apparently brought upon himself all his subsequent sufferings. If he chooses to take such risks he must take the consequences himself.

“The plain truth is that this plaintiff was probably afflicted with a tendency to tuberculosis, and when he received his injury that tendency became developed in the bones of his leg and the disease called tuberculosis of the bone fastened upon him at the seat of the injury. Dr. L. held to this theory and treated him for it with success. When this witness testified for the plaintiff he was asked, ‘Q. Were there any broken bones in the limb? Had there been a fracture? A. No evidence of it at the time of my examination.’ Continuing, he said, ‘No particular bone was injured so far as was evidenced at the time of my examination. At that time I discovered a tuberculous inflammation involving the totality of the ankle-joint, extending into the substance of the lower end of the tibia and astragalus, disintegrating these and causing small pieces of bone to drop off from them with the rest of the products of inflammation.’ On the second trial he testified, ‘What we mean by tuberculous arthritis is this: there is such a disease as tuberculosis that is very widely disseminated in nature. Sometimes it develops in people’s lungs and then it is called consumption, and when it develops in a man’s ankle it is called a tuberculous arthritis. Now, in this patient’s case he had all the predisposition that a patient has to develop consumption, but inasmuch as he injured his ankle, that spot—that is, the ankle—became the weakest spot in his body, and, having the predisposition to develop tuberculosis, he developed tuberculosis of the ankle-joint.’ . . . ‘What I had there was tuberculous disease. There was no evidence of the fracture, there was no play of the bones at all. Everything was united and solid, and I didn’t care whether he had had a fracture or not. That didn’t enter into the case. He had tuberculosis of the joint. He came there to be treated for tuberculosis of the joint, and that I did for him.’ The foregoing theory,” adds the Supreme Court, “is the only one that will satisfy all the facts in evidence.” And the judgment against the defendant surgeon was accordingly reversed.

BOOK REVIEWS.

MINOR SURGERY AND BANDAGING. By Henry R. Wharton, M.D., Demonstrator of Surgery in the University of Pennsylvania, Surgeon to the Presbyterian, Methodist Episcopal, and Children's Hospitals. Third edition, thoroughly revised and enlarged, with 475 illustrations. Philadelphia and New York: Lea Brothers & Co., 1896.

The fact that this book has reached its third edition inside of five years is evidence enough both of its popularity and worth.

The present edition has been revised and enlarged by the addition of new material upon the subjects of excisions of the joints, operations upon the nerves, tendons, etc. Although not intended as an elaborate treatise on operative surgery, it will nevertheless be found to be an almost complete guide to the operations usually taught to students. It is a very complete exposition on the subject of which it treats, embracing the whole domain of minor surgery and a considerable portion of that of major surgery. It is pre-eminently fitted by its conciseness and excellence of arrangement to be used as a text-book for students.

G. G. D.

LE GONOCOQUE. Par Dr. Marcel Sée, Ancien Interne des Hôpitaux de Paris. 8vo, pp. 355. Paris: Ancienne Librairie germer Baillière et Cie., Félix Alcan, Éditeur. 1896.

This volume of three hundred and fifty-five pages is devoted to a *résumé* of the literature relating to the gonococcus, to the record of fifty experiments with the organism, and to the record of thirty-six complicated and uncomplicated cases of gonococcus-infection.

The work consists of two parts and an appendix. In the first part of the book we have an experimental study of the gonococcus, which, in four chapters, treats of its microscopic examination, of its culture, of its biology out of the organism, and of its inoculation into man and animals.

In the second part of the volume we meet with an exhaustive clinical study of the disease produced by the micro-organism under discussion. Original experiments and record of personally observed cases find place in the appendix.

The work is valuable for its matter and for the bibliography which it contains. The general conclusions, given on page 208, are valuable, and will bear being emphasized.

First: Blennorrhagia is a specific, infectious disease, arising only from itself and by the inoculation of blennorrhagic products. Its manifestations are multiple, as are the manifestations of the majority of infections, and urethritis is only the most frequent.

Non-blennorrhagic urethritis exists distinct, even clinically, from urethral blennorrhagia.

Second: The gonococcus of Neisser is the cause of blennorrhagia. This is a pathogenic micro-organism, and is as definitely characterized by its morphologic and biologic properties as by its action upon the human organism.

The gonococcus is clearly distinct from the saprophytes of the genito-urinary

apparatus, and is diagnostic. It is never found as the normal inhabitant of any organ.

Third: If it is true that certain blennorrhagic manifestations are of a toxic nature, and if, on the other hand, secondary affections are frequent in blennorrhagia, it is not less certain that the majority of blennorrhagic manifestations are, or at least may be, caused directly by the presence of the gonococcus at the diseased points.

The gonococcus may be carried especially by the blood-paths in order to give rise to diseased foci, such as arthritis and endocarditis, at a distance from its point of entrance into the economy.

J. M. S.

NEW METHODS IN THE SCIENCE OF FITTING GLASSES. By W. G. Fay, Optician. Small 8vo, pp. 115. Springfield, Ohio: The Hosterman Publishing Co., 1896.

This little book is of interest to the physician, as in it the author states that the old method of prescribing glasses simply to improve the vision is insufficient, endeavors to show that the new and proper way is always to relieve the eye-strain and consequent exhaustion of the nerve energies, whether vision is improved at first or not.

He formulates various rules of procedure, giving preference to an optomyometer of his own construction for the recognition of the total amount of error, and he makes slightly varying plans for the selection of lenses that are to be used in the patient's spectacle-frames.

The reviewer has been well pleased with the manner in which some of the subject-matter has been put, and would recommend the book for both study and criticism.

C. A. O.

RÖNTGEN RAYS AND PHENOMENA OF THE ANODE AND CATHODE. By Edward P. Thompson, M.E., E.E. New York: D. Van Nostrand Co.

In this little volume of nearly two hundred pages, and containing over one hundred illustrations, the author has traced with the greatest care the various steps in the history of the development of the electric discharge from the time of Faraday to the present.

The period may conveniently be divided into three epochs with reference to the degree of exhaustion in the tubes or vessels through which the discharge takes place. In the experiments of Faraday, Plücker, and Geissler the internal pressure was only about one one-thousandth of an atmosphere; while in the experiments of Hittorf (1869) and of Crookes (1879) an internal pressure of only one one-millionth of an atmosphere was obtained.

The various investigations of these men, together with those of many others, including Spottiswoode, Moulton, De La Rue, Hugo Müller, Goldstein, Wiedemann, Elster and Geitel, J. J. Thomson, Hertz, Lenard, and finally of Röntgen, are treated with great fidelity.

In nearly every case reference is made to the literature from which the information was obtained, this proving of great value to a student who wishes to look up more in detail any special part of the subject.

The first six chapters are concerned with the history up to the time of Röntgen's discovery of the X-rays proper.

The latter half of the book deals mostly with the results of experiments, both in this country and in Europe, from a practical as well as from a theoretical point of view. Moreover, it seems to be the conviction of the author that in the character of the work done and in the results obtained our own country has not been surpassed by any of those of Europe.

In the final chapter, on "Theoretical Considerations," Professor Anthony briefly

sums up our present knowledge of the subject, carefully avoiding to commit himself to any one of the several theories discussed.

This book should prove of the greatest value to any one wishing to obtain a hasty view of the subject.

A. W. G.

OPHTHALMIC OPERATIONS AS PRACTISED ON ANIMALS' EYES. By Clarence A. Veasey, A.M., M.D., Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic, Chief Clinical Assistant to the Ophthalmological Department, Jefferson Medical College Hospital, etc. Small 8vo, pp. 99. Philadelphia: The Edwards & Docker Co., 1896.

This little book, the first of its kind, has been prepared by one who has had a most carefully trained experience in such work. The methods of technique have been more or less limited to the most common operations in and around the eyeball.

Commencing with the choice of eyes, the time of removal from the animal, and the best methods of preservation for operation purposes, it next deals with the various forms of phantom-masks, etc.

From these general considerations, the operations are described *ad seriatim* in a way that can be well understood by beginners in ophthalmology for whom the book has been written.

The reviewer, having found it useful among his own students, cordially recommends it to those who desire such information and knowledge.

C. A. O.

SKIASCOPY AND ITS PRACTICAL APPLICATION TO THE STUDY OF REFRACTION. By Edward Jackson, A.M., M.D., Professor of Diseases of the Eye in the Philadelphia Polyclinic and College for Graduates in Medicine; Surgeon to Wills Eye Hospital, etc. Second Edition. With twenty-seven illustrations. 8vo, pp. 108. Philadelphia: The Edwards & Docker Co., 1896.

It is very gratifying to the reviewer that this excellent manual, based upon the careful and conscientious experience of one who is master in this art, should so soon be brought to a second edition.

The work is one that must live and ever be the guide of the practical ophthalmologist. Expressed in terms that are terse and easily understood; written in a style that can be readily comprehended by the beginning student; and containing much that is new and original for the guidance of the advanced and working practitioner; it, in each case, subserves a purpose that is indispensable. That it should be upon the work-table of all who are interested in, teach, or deal with the subject in any way there can be no doubt; that it is the best exponent of the method that we now possess is certain.

C. A. O.

THE READY-REFERENCE HAND-BOOK OF DISEASES OF THE SKIN. By George Thomas Jackson, M.D. With sixty-nine illustrations. Second Edition, revised and enlarged, pp. 594. Philadelphia: Lea Brothers & Co., 1896.

This revised edition is a satisfactory successor to the first. The same character of alphabetical arrangement of diseases, terseness of text, clearness of expression, and a full proportion to the subject of treatment, give distinct individuality and value to the book. Nineteen new illustrations have been added, and the text has been considerably increased. To make the volume more comprehensive a brief presentation of the rarer and new diseases has been added,—such as acromegaly, actinomycosis, angioma serpiginosum, clavus syphiliticus, dermatitis repens, multiple benign cystic epithelioma, erythema induratum, feigned eruptions, etc. Dr. Jackson is a good observer, a clear writer, and trustworthy in his therapeutical directions. These qualities are reflected in the book, and make it therefore a valuable hand-book for the student and the busy practitioner; and to this large class we commend it cordially.

H. W. S.

AN AMERICAN TEXT-BOOK OF APPLIED THERAPEUTICS. For the Use of Practitioners and Students. Edited by J. C. Wilson, M.D., Professor of the Practice of Medicine and of Clinical Medicine in the Jefferson Medical College, etc., etc. Assisted by Augustus A. Eshner, Professor of Clinical Medicine in the Philadelphia Polyclinic, etc. Price: Cloth, \$7.00; sheep or half morocco, \$8.00; half Russia, \$9.00. Philadelphia: W. B. Saunders, 1896.

This is the latest addition to the series of "American text-books," and although it deals chiefly with the medical side of therapeutics it makes a large volume of 1326 pages. The subjects are allotted to the various authors as follows: Dr. I. E. Atkinson, of Baltimore, treats of acute poisonings, influenza, and the resuscitation of persons apparently drowned; Dr. Victor C. Vaughan, of Ann Arbor, of the food infections; Dr. Eshner, of milk-sickness, miliary fever, sweating-disease, Weil's disease, and infective jaundice; Dr. Frese treats of drug-habits; Dr. Robert T. Edes, of chronic intoxications; Dr. John Chalmers DaCosta, of septicæmia and pyæmia, erysipelas, anthrax, hydrophobia, tetanus, glanders, and actinomycosis. Diphtheria is admirably treated by Dr. W. P. Northrup, of New York. This article is full of instructive illustrations, which, by the way, are liberally scattered through the work and make this series of text-books especially valuable. Dr. Louis Starr treats of whooping-cough, and Dr. J. W. McLaughlin of dengue.

The most interesting article in the book is that by the editor. Dr. Wilson devotes fifty pages to the treatment of typhoid fever, in which he fully unfolds the Brand system, in the use of which he has had such marked success. That this method of treatment is based upon principles which are as yet not fully understood is seen from the fact that the author states that the theories of its action are not entirely satisfactory; for, although the bath is powerfully antipyretic, its influence in this respect must be regarded, in part at least, as secondary. Its chief action is exerted on the nervous system, which it affects in such a manner as to increase its resistance to the toxic principles of the disease. This, the author says, is doubtless accomplished by the action of the cold water on the peripheral nerve-endings, a stimulus being transmitted to the nerve centres presiding over the functions of the circulation, respiration, digestion, nutrition, and excretion.

The editor also takes up the treatment of typhus and relapsing fever, cerebro-spinal meningitis, and the plague. Yellow fever is treated by Professor John Guitéras, who speaks from his unusual experiences at Havana, and more lately at Jacksonville and Brunswick, where he rendered such energetic assistance to the United States government in stamping out the disease. Cholera is also treated by one of the government's experts, Dr. E. O. Shakespeare. The chapter on leprosy is by the late Dr. Beaven Rake, of Trinidad. Croupous pneumonia is treated by Dr. Danforth, of Chicago; tuberculosis, by Dr. James T. Whittaker, of Cincinnati. This article is in seventy pages and is thorough and eminently practical. It shows wide reading and as wide an experience. Syphilis is treated by Dr. Orville Horwitz; dysentery, by Dr. W. W. Johnston; and malaria, by the famous Dr. A. Laveran.

Malarial fever is treated by Dr. John L. Dawson, Jr., of South Carolina, and the exanthemata by Dr. George Dock, of Ann Arbor. The animal parasites and diseases dependent on external heat are treated by Dr. F. A. Packard, of Philadelphia; rheumatism, gout, rheumatic arthritis, and scurvy, by Professor Stewart, of Montreal; obesity, by Dr. Henry, of Philadelphia; diseases of the stomach, by Dr. Charles G. Stockton; the intestines, by Dr. W. W. Johnston; the liver, by Dr. Dabney; the diseases of infants, by Dr. E. E. Graham; diseases of the heart, by Dr. Forchheimer; and diseases of the blood by Dr. Osler. Nervous and mental diseases are treated at the hands of Drs. Eskridge, Dercum, Lloyd, Sinkler, Hinsdale, Mills, and Chapin.

The careful editing, the excellent arrangement, and the perfect execution make this book a standard work of reference that will not fail to give great satisfaction to practitioners.

ITEMS OF INTEREST.

The Public Health Act of 1896 came into operation on November 9, finally abolishing the last remnant of quarantine which was maintained against yellow fever and plague in order to secure the commerce of Great Britain against unnecessary restrictions in foreign ports. This change transfers the control of yellow fever and plague in ports from the Privy Council to the Local Government Boards of the three divisions of the

The Last of Quar-
antine in the
United King-
dom.¹

kingdom. The Local Government Board has issued an order embodying their regulations regarding yellow fever, plague, and cholera, the preventive measures concerning the two former diseases being practically the same as those which have been so successful in the prevention of cholera. No difficulty is anticipated with foreign nations from the change. In the opinion of the *Lancet*, most nations have come to realize that British methods of dealing with cholera in its own ports are really as effectual as theirs. It is noted that unless ships supposed to be infected with yellow fever or plague happened to select the Solent for purposes of arrival the usual port authorities would deal with the matter, having done so, in fact, as regards yellow fever. The *Lancet* also wishes that the same abandonment of antiquated forms would be observed regarding the crown colonies of the Mediterranean, for which the advisers to the crown are responsible. It is hoped that soon local legislators of these colonies will learn that the best measures for prevention of disease are found in sanitary improvements, and that too implicit trust in quarantine restrictions avoids the strongest incentive to expenditure in measures for the promotion of public health.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

¹ *Lancet*, November 14, 1896.

INDEX

TO

INTERNATIONAL MEDICAL MAGAZINE,

Volume V.

1896-97.

The figures referring to the original communications and clinical lectures are printed in *heavy-faced type*.

A.

- Abbe, Robert, M.D., tuberculous peritonitis, **334**.
 Abscess of the liver, 60.
 Acetanilid-poisoning, 134.
 Acromegaly, a case of, with autopsy, 360.
 partial epilepsy in, 727.
 Addison's disease, **3**.
 experimental, in the sewer-rat, 218.
 Adenitis, treatment of cervical tuberculous, **326**.
 Alcohol, action of, on digestion, 127.
 Alcoholism in children, 579.
 influence of, on the normal vital resistance of rabbits to infection, 587.
 Alexander's operation, 597.
 Alopecia, local, in a case of traumatic hysteroneurasthenia, 146.
 American Electro-Therapeutic Association, 680.
 Anæsthesia, fiftieth anniversary of the discovery of, 742.
 Analgesia of the ulnar and peroneal nerves as a sign of tabes, 418.
 Anatomical material, preparation of, 84.
 Anchylostoma duodenale, 298.
 Aneurism, dissecting, of the aorta; rupture into the pericardium, 124.
 of the abdominal aorta, with thrombosis of the right renal artery, **506**.
 of the left internal carotid, 417.
 simultaneous, double, of the superficial femoral on the same side, 50.
 Angeiocholitis and cholecystitic, treatment of, 275.
 Anorexia, treatment of hysterical, by hypodermic injections of morphine, 268.
 Anticholeraic inoculations at Calcutta, 583.
 Antipyretics, the value of, 356.
 Antipyrin as a local analgesic, 726.
 Antituberculous serum and its antitoxin, 722.
 Arnold, J. P., M.D., Review of Surgery, 53, 137, 225, 273, 358, 413, 474, 517.
 Ashhurst, John, Jr., M.D., surgery before the days of anæsthesia, **545**.

- Autopsy, consent of widow necessary to authorize an, on the body of her deceased husband, 302.

B.

- Babcock, R. H., M.D., treatment of hæmoptysis, **510**.
 Bacillus of syphilis, 88.
 pyocyaneus, case of general infection by the, 219.
 Bacteria, absence of, in the alimentary canal, 295.
 Barber's itch, **40**.
 Beck, Carl, M.D., pyothorax, **768**.
 Bell, Robert, M.D., treatment of carcinoma of the uterus, certain forms of ovarian disease, and fibroids of the uterus by means of thyroid, parotid, and mammary gland therapeutics, **379**.
 Bismuthum betanaphtholicum, 128.
 Blackader, Alexander D., B.A., M.D., Review of Therapeutics, 51, 127, 221, 268, 350, 472, 512, 583, 665, 720.
 Blepharitis trichophytica, 72.
 Blood-serum of healthy and diphtheritic children, 466.
 specific gravity of the, 47.
 Bondurant, E. D., M.D., arterio-sclerosis among the insane, **394**.
 Bowditch, Vincent Y., M.D., contagiousness of pulmonary consumption, **387**.
 Bowen, Cuthbert, M.D., dochmius duodenalis as a cause of anæmia in Barbadoes, **212**.
 Brain, hemorrhage and oedema of, 523.
 surgery, with special reference to brain tumors, 148.
 tumor, two cases of, in two sisters, 146.
 British Medical Association, 540.
 Bromide of strontium in epilepsy, 721.
 Bronchitis, diffuse infantile, treatment of, by warm baths, 351.
 Bryonine, 128.
 Bulette, Lorenzo D., Forensic Medicine, 76, 232, 302, 367, 422, 488, 525, 608, 674, 732, 809.
 Burrell, Herbert L., M.D., ligature of the innominate artery, **111**.

C.

- Cæsarean sections, three successful, upon the same woman, 597.
- Calcium permanganicum, 128.
sulphophenylicum, 128.
sulphuratum, 128.
- Canadinum hydrochloricum, 128.
- Cancer of the stomach, special test for, 43.
surgical treatment of, 276.
- Carbon-bisulphide poisoning, 721.
- Carcinoma of the breast in its early stages, diagnosis of, 413.
treatment of inoperable cases of, by removal of the uterine adnexa and administration of thyroid extract, 475.
of the uterus, certain forms of ovarian disease, and fibroids of the uterus, treatment of, by means of thyroid, parotid, and mammary gland therapeutics, **379**.
-serum, contribution to the casuistry of, treatment with, 581.
- Cardiac failure, a discussion on treatment of, 665.
- Catgut, sterilization of, by a new process, 275.
sterilized with formalin, 72.
- Catheterization of the ureters in the male, 141.
- Cattell, Henry W., M.D., preparation of frozen sections by means of methyl and ethyl chloride, **706**.
Review of Pathology, 74, 152, 295, 365, 419, 484, 606.
Röntgen's discovery, **1**.
- Cerebritis resembling cerebro-spinal meningitis, 669.
- Children of feeble resistance, their care and management, **439**.
- Chinese treatment for small-pox, 541.
- Cholelithotomy, a study of, **92, 161**.
associated with interventions on the gall-bladder or bladder and cystic duct at the same time, **162**.
- Chorio-retinitis, double, in the macular regions, following a flash of lightning and a flash from burning lycopodium, **562**.
- Chromidrosis, two cases of, 124.
- Chylopericardium, 53.
- Chylothorax, 53.
- Cigarette habit, 51.
- Cirrhosis of the liver in a boy, 218.
- Cocaine in the study of pond-life, 297.
- Cœliotomy, 17.
- Collins, Joseph, M.D., asthenic bulbar paralysis, **203**.
- Coloboma, a case of binocular extrapapillary, 601.
- Contract for sale of a physician's practice, of which specific performance was decreed, 76.
- Contributory negligence defeating an action for alleged malpractice, 732, 809.
- Cord lesions produced by microbic toxins, 727.
- Coroner, power of, to order a post-mortem examination without consent of the family of deceased, 488.
- Counter-claim for physician's services allowed in an action against him for malpractice, 608.
- Creosote carbonate in pulmonary tuberculosis, 51.
in tuberculosis, 355.
- Crouch, H. C., M.D., dilatation of the stomach, **246**.
- Cumston, Charles Greene, M.D., relationship between the veins of the head and neck, and the pathology of the parts, **708**.
- Curtin, Roland G., M.D., congenital narrowing of the mitral orifice as a cause of dwarfed lives and irritable heart, **639**.

Cyanosis, absence of congenital malformation of heart in, 803.

Cystitis, **36**.

D.

- Degeneration, secondary, in compression of the spinal cord, 593.
- Dejerine, Professor and Madame, connections of the fillet with the cerebral cortex, **11**.
- Diabète bronzé, a case of, with autopsy, 214, 216.
- Diabetes mellitus in early infancy, 217.
treatment of, by the ingestion of pancreas, 127.
- Diaphragm phenomenon, 470.
- Diphtheria, mortality from, since the use of serum, 127.
treated with antitoxin, 74.
treatment of, by hydrochlorate of pilocarpine, 472.
- Diphtheritic paralysis, 144.
- Diplegia facialis, 362.
- Diseases of the mouth, 46.
- Disseminated sclerosis, 291.
- Doehmius duodenalis as a cause of anæmia in Barbadoes, **212**.
- Drainage after cystotomy, 359.
- Dudley, William F., M.D., the uric acid diathesis and its effect upon the upper respiratory tract, **573**.
- Duration of phthisis, 220.
- Dysentery, amœbic, and liver abscess, a case of, 264.

E.

- Eclampsia, treatment of, 69.
- Electrical irritation of first thoracic root in man, 725.
- Embolism of the central artery of the retina, 276.
- Enchondroma of the cartilage of the upper lid, 150.
- Endocardial efflorescences in tubercular patients, 408.
- Endocarditis and pyæmia produced by the bacterium coli communis, 409.
febrile, in the aged, **501**.
following gonorrhœa, 118.
- Eosinophile cells in carcinoma, 343.
- Epilepsy, pathology of, 806.
treatment by pituitary extract, 729.
- Erichsen, Sir John, death of, 743.
- Eruption in alcoholic cirrhosis, 219.
- Erythema exudativum multiforme, visceral complications of, 46.
- Ether and chloroform, influence of, upon the kidney, 58.
- Evans, D. J., M.D., Review of Therapeutics, 51, 127, 221, 268, 350, 472, 512, 583, 665, 720.
- Extraction of teeth in connection with paralysis of the seventh nerve, 231.
- Eye, employment of dry dressings and powders, 674.

F.

- Facial paralysis in an infant after a normal labor, 672.
- Fæcal tumors, a symptom of, 718.
- Failure of attending physician to send, as promised, a specialist to attend his patient not malpractice, 525.
- Fat, dietetic value of, in diabetes, 802.
emboli, 56.
- Father of Nobody's Children, 541.
- Fibrin in the blood, amount of, 345.
- Fibroma of the vaginal wall, 286.

Fibromyoma complicating pregnancy, **17**.
Filaria nocturna, 419.
 Fillet, connections of, with the cerebral cortex, **11**.
 recent investigations concerning the, 231.
 Fingers and toes, congenital deficiency of, **91**.
 Flagellated bacteria, 299.
 Focal epilepsy, surgical treatment of, 807.
 Fractures near a joint, treatment of, 62.
 Friedenwald, Julius, M.D., the importance of the saliva in gastric digestion, **425**.
 Frozen sections, preparation of, by means of methyl and ethyl chloride, **706**.

G.

Gastrostomy by Frank's method, 59.
 for the removal of hair ball, 144.
 or enterotomy, method of temporarily closing the opening after, 477.
 Gelanthum, 588.
 Genito-urinary tuberculosis, influence of climate on, **391**.
 Gibson, W. M., M.D., febrile endocarditis in the aged, **501**.
 Glenwood Springs, Colorado, the waters of, 524.
 Glioma of the cerebellum, 291.
 Gonorrhoeal metritis, 284.
 tubal disease, palliative treatment of, 71.
 Goodspeed, Arthur W., Ph.D., progress in radiography, **317**.
 Gout and uric gravel, treatment of, 352.
 Grape-sugar in the urine and amniotic fluid, 672.
 Gray, Landon Carter, M.D., Review of Neurology, 64, 144, 229, 288, 360, 415, 478, 518, 590, 669, 723, 804.
 Guinea-worm, on the, 221.

H.

Hæmoptysis, treatment of, **510**.
 Harvard Medical School, a degree to be required for admission to the, in 1901, 316.
 Heart-disease, Nauheim Schott's treatment of, 122.
 Heart in anæmia, 48.
 Heart-lesions, production of, by contusions of the heart, 55.
 Heart's action, arrest of, and of respiration during chloroform anæsthesia; bleeding from internal jugular vein; recovery, 474.
 Hemianopsia in uræmia, 119.
 Hemiatrophy of the face from central disease, 725.
 acute, of the tongue, 415.
 Hemiplegia, frequency of laryngeal paralysis in, 483.
 Hemorrhage, prognosis of cerebral, 145.
 Hemorrhages, their relation to barometric pressure, 412.
 Hemorrhagic neuro-retinitis, 241.
 Hernia, treatment of the sac in, 139.
 radical treatment of, and its present status, 273.
 Herniæ, radical operation in uncomplicated, by the position method, 63.
 Hersman, C. F., M.D., a case of leprosy of the mixed type, **373**.
 Hinsdale, Guy, M.D., Review of Climatology, 523.
 Review of Neurology, 64, 144, 229, 288, 360, 415, 478, 518, 590, 669, 723, 804.
 syringomyelia, **617, 681, 745**.

Horse-nettle in epilepsy, 149.
 Hospital wards, use of, for the experimentation with secret nostrums, 539.
 Hungary's millennial celebration, 542.
 Hydrocele, a new method of operating for, 414.
 Hydrophobia, the preventive treatment against, during 1894 and 1895, 222.
 Hyperpyrexia in children, 272.
 Hyposulphite of sodium, antitoxic action of, against cyanide of potassium and malonitrite, 726.
 Hysterical achillodynia, 671.
 attacks, loss of consciousness in, 595.
 buccal and cutaneous ulcerations, oedema, erythema nodosum, and orchitis, origin of, 518.
 trophic lesions of the teeth, 590.

I.

Imperial University of Japan, 86.
 Ingalls, E. Fletcher, M.D., the treatment of cervical tuberculous adenitis, **326**.
 Innominate artery, ligature of, **111**.
 Insane in Pennsylvania, 542.
 Insanity treated with thyroid extract, 294.
 Insomnia due to noise, 135.
 International congress of dermatology, 314.
 of obstetrics and gynaecology, 744.
 of psychology, 543.
 Intradural section of spinal nerves for neuralgia, 727.
 Intramedullary course of the posterior roots in the cervical and superior thoracic regions of the spinal cord, 519.
 Iodism prevented by belladonna, 145.
 Ipeacacuanha, Brazilian and Colombian, 357.
 Itching, pathology of, and its treatment by large doses of calcium chloride, 516.

J.

Jameson, Dr., 86.
 Jefferson Medical College, changes at, 85.
 Jourdan, Maurice, M.D., a study of cholecystotomy, **92, 161**.
 Judge, an angry, 540.
 Juxta-articular osteo-tuberculosis, 57.

K.

Keen, W. W., M.D., skiagraphy of the head and trunk, **319**.
 King, Clarence, M.D., a case of congenital deficiency of the fingers and toes, **91**.
 Knight, Frederick I., M.D., laryngeal vertigo, **325**.

L.

Laborde's rhythmical traction on the tongue, 730.
 Lactate of strontium in nephritis, 354.
 Landolt, Edmund, M.D., Review of Ophthalmology, 72, 150, 276, 599, 673.
 Landry's paralysis, with recovery, 289.
 Laparotomies for tuberculous peritonitis, 517.
 Lateral curvature of spine, 44.
 Lawrie's views of the malarial parasite, 341.
 Lecithine, influence of, upon the growth and multiplication of organisms, 222.
 Legal liability of a medical and surgical institute for the false representations of its president and physician-in-charge as to the cure of a patient, 232.
 responsibility of a physician for the negligence of his professional substitute, 422.

Leontiasis ossæ, 482.
 Leprosy of the mixed type, **373**.
 Leucocytes, estimation of the, in the urine, 120.
 Leucocytosis, the question of, in tuberculous processes, 125.
 Li Hung Chang's physicians, 615.
 Lobar pneumonia with hyperpyrexial temperature of 109° F.; recovery, 719.
 Lymphangiectasia and lymphorrhagia, 412.
 Lyon, H. W., M.D., a case of leprosy of the mixed type, **373**.

M.

Macroscopic specimens, preservation of, 487.
 Magill, William S., M.D., a study of choledochotomy, **92, 161**.
 Magnesium permanganicum, 128.
 Malarial blood-films, a rapid and convenient method of preparing, 484.
 germ outside the human body, 342.
 Malpractice, a case of, 674.
 Maragliano's antitoxin-serum, 588.
 Maunsell's method of intestinal anastomosis, technique of, 142.
 Meat-poisoning, 485.
 Mechanical water-filters, **551**.
 Medical education in Great Britain, 614.
 press, changes in the, 88.
 Medulla oblongata, paralysis from injury of the lower part of the, 229.
 Medullated nerve-fibres of the human retina, 603.
 Ménière's disease in leukæmia, 416.
 Meningitis, acute, from the staphylococcus, 66.
 Meningomyelitis in tabes, general paralysis, and spinal syphilis, 364.
 Metallic foreign body, extraction of, from the eye with an electro-magnet, 673.
 Metropolitan Trained Nurses' Club, 87.
 Meyer memorial, 315, 543.
 Mitral orifice, congenital narrowing of, as a cause of dwarfed lives and irritable heart, **639**.
 Moisture in the treatment of infected wounds, 55.
 Morton, Thomas G., M.D., the application of the X-rays to the diagnosis of Morton's painful affection of the foot, or metatarsalgia, **322**.
 Motor polyneuritis of slow development, 288.
 Movable kidney, 140.
 Mulhall, J. C., M.D., a case of simple serous recurrent pleural effusion; its final outcome, **109**.
 Multiple neuritis occurring among insane patients, 728.
 the essential element in Landry's paralysis, 149.
 sclerosis (clinical portion), pathology of, 479.
 pathology of, 520.
 Munro, John C., M.D., the influence of climate on genito-urinary tuberculosis, **391**.
 Murphy, John B., M.D., fibromyoma complicating pregnancy, **17**.
 Muscular flaccidity (hypotonia) in tabes dorsalis, 418.
 Musser, John H., M.D., a case of aneurism of the abdominal aorta, with thrombosis of the right renal artery, 506.
 Review of Medicine, 43, 118, 214, 258, 339, 406, 465, 579, 663, 718, 802.
 Mycetoma of the foot in America, 227.
 Myelitis, acute, from the toxins of streptococci and staphylococci, 521.
 transverse, two cases of, 481.
 Myelocyte of Ehrlich, 298.

N.

Narrowing of the pulmonary artery considered as a manifestation of tubercular heredity, 465.
 Nephrectomy in tuberculosis of the kidneys, 359.
 Nephritis, some of the symptoms consecutive to an experimental, 218.
 Nerves of taste, 417.
 Neuritis, traumatic ulnar, 724.
 Neuron, the functions of the, 670.
 Neuroses, traumatic, in their medico-legal relations, 729.
 New Guide to the Press, 743.
 New Mexico, climate of, 524.
 Newspaper account of a trial, 87.
 Nitrogen or albumin contained in the sputum in lung-diseases, 664.
 Norris, Richard C., M.D., Review of Obstetrics and Gynæcology, 69, 284, 596, 672, 730.

O.

Obstetrics and Gynæcology, International Congress of, 744.
 Ocular tuberculosis, prognosis of, 808.
 Oculomotor centres, localization in the, 363.
 Oliver, Charles A., M.D., a clinical study of a case of double chorio-retinitis in the macular region following a flash of lightning and a flash from burning lycopodium, **562**.
 An ophthalmoscopic study of a case of hemorrhagic neuro-retinitis, **241**.
 Review of Ophthalmology, 72, 150, 276, 599, 673, 808.
 Oöphorectomy per vaginam, 284.
 Ophthalmoplegia and laryngeal paralysis in tabes, 591.
 Opium, Chinese, 224.
 Optic atrophy, early effects of, upon course of locomotor ataxia, 805.
 nerve, alveolar fibro-sarcoma of the, 151.
 Orange Free State, climate of, 680.
 Organ-extracts, present position of treatment with, 136.
 Osler, William, M.D., six cases of Addison's disease, **3**.
 biographical historical studies, 240.
 Ovarian tissue, administration of, 598.
 Oyster-shuckers' keratitis, 73.

P.

Pancreatitis with hemorrhage, a fatal case of, 469.
 Paralysis and muscular atrophy following injection of the sterilized culture of the pneumococcus, 591.
 asthenic bulbar, 203.
 bulbar, 415.
 facial, 806.
 of the hypoglossus, right-sided, 418.
 Paralytic lyssa humana, 340.
 Paraplegia, acquired spastic, 64.
 Parasitic ictero-hæmaturia of the sheep, 265.
 Park, Roswell, M.D., on susceptibility and immunity, with special reference to surgical cases, **330**.
 Patent-medicine literature, a use for, 496.
 Pepper Clinical Laboratory, 85.
 Perforation of the nasal septum, **333**.
 Pericardial effusions, 347.
 Peripheral neuro-tabes, 67.
 Perithelioma, 146.

Peritonitis, tuberculous, **334**.
 Permanganate of potassium in opium-poisoning, 474.
 Pernicious anæmia, spinal cord in, 482.
 Phlegmonous gastritis, a case of diffuse, 471.
 Phonendoscope of Dr. Bianchi, 267, 802.
 Phthisis, duration of, 220.
 Picric acid in burns, 269.
 Pleuro-pneumonia, subcutaneous abscess developed in the course of, 219.
 Pneumonia, rarity of, in Florida, 523.
 Pneumothorax, a case of subphrenic, 665.
 Poliomyelitis, chronic anterior, as the cause of chronic progressive atrophic paralysis in diabetes mellitus, 360.
 Polymyositis acuta, 470.
 or dermatomyositis, 262.
 Posterior roots in man, course of the, 724.
 Primary muscular dystrophy in two brothers, 804.
 Prince Bismarck, M.D., 496.
 Pritchard, William Broadus, M.D., Review of *Neurology*, 64, 144, 229, 238, 360, 415, 478, 518, 590, 669, 723, 804.
 Progressive muscular dystrophy considerably improved by methodic gymnastics, 416.
 Prolapse and pelvic fixation of the ovaries, 286.
 Prolapsus uteri, 672.
 Propeptone, effect of ligature of the lymphatics of the liver upon the anticoagulant action of, 582.
 Prostate, hypertrophy of, 57.
 Pseudo-spastic paresis with tremor following trauma, 804.
 Pterygium, traumatic, 599.
 Ptosis, a new operation for congenital, 280.
 Pulmonary consumption, a plea for moderation in our statements regarding the contagiousness of, **387**.
 tuberculosis treated by serotherapy, 581.
 Pupil, variation of, dependent upon pulmonary disease of tuberculous nature, 73.
 Pure word-deafness, 671.
 Pyocyanic disease in human pathology, 718.
 Pyothorax, **768**.
 Pyramidal fibres in the anterior and lateral columns, 416.
 tracts, degeneration of, after unilateral extirpation of the centres for the extremities, 723.

Q.

Quantitative determination of the hydrochloric acid in human gastric juice, 406.
 Quarantine in the United Kingdom, last of, 816.

R.

Radii, congenital absence of both, **89**.
 Radiography, progress in, **317**.
 Rare forms of hereditary and family cerebral and spinal disease, 723.
 Rattlesnake-bite, recovery, **646**.
 Raynaud's disease, cerebral complications of, 805.
 Red Cross Society, founder of the, 744.
 Reflex action of operative traumatism upon circulation and respiration, 596.
 Respiratory surface, redundancy of, **30**.
 Reviews:
 Allbutt's System of Medicine, 529.
 Allis on the Reduction of Dislocations of the Hip, 528.
 American Text-Book of Obstetrics, 308.
 Text-Book of Surgery, 235.

Reviews :

Bell's Notes on Surgery for Nurses, 81.
 Boislaniere's Obstetric Accidents, Emergencies, and Operations, 370.
 Buck's Vest-Pocket Medical Dictionary, 740.
 Bureau of Health of Philadelphia, 1895, annual report of, 612.
 Byford's Manual of Gynæcology, 82.
 Deaver on Appendicitis, 528.
 De Schweinitz on Diseases of the Eye, 677.
 on Toxic Amblyopias: their Classification, History, Symptoms, Pathology, and Treatment, 611.
 Dorland's Manual of Obstetrics, 527.
 Symptoms, Pathology, and Treatment, 611.
 Fay's New Methods in the Science of Fitting Glasses, 813.
 Fothergill's Manual of Midwifery, for the Use of Students and Practitioners, 678.
 Fuller on Disorders of the Male Sexual Organs, 309.
 Gould's American Year-Book of Medicine and Surgery, 307.
 Borderland Studies, 533.
 Students' Medical Dictionary, 537.
 Gowers on Diseases of the Nervous System, 312.
 Grandin's Pregnancy, Labor, and the Puerperal State, 80.
 Grant's Diagnosis and Treatment of Diseases of the Rectum, Anus, and Contiguous Textures, 527.
 Green's Introduction to Pathology and Morbid Anatomy, 237.
 Hare's Text-Book of Practical Therapeutics, 310.
 Haynes's Manual of Anatomy, 553.
 Hayden's Manual of Venereal Diseases, 739.
 Helfferich's Atlas of Traumatic Fractures and Luxations, with a Brief Treatise, 371.
 Houston's Electricity in Electro-Therapeutics, 536.
 Jackson's Ready-Reference Hand-Book of Diseases of the Skin, 814.
 Skiagraphy and its Practical Application to the Study of Refraction, 814.
 Jacobi's Therapeutics of Infancy and Childhood, 371.
 Jakob's Atlas of the Normal and Pathological Nervous Systems, 306.
 James on Royal Infirmary Cliniques, 612.
 Jennings's Color-Vision and Color-Blindness, 313.
 Lang's Methodical Examination of the Eye, 424.
 Leonard's Pocket Materia Medica and Therapeutics, 311.
 Lockwood's Manual of the Practice of Medicine, 532.
 Loomis's Text-Book of Practical Medicine, 537.
 McGillicuddy's Functional Disorders of the Nervous System in Women, 678.
 Mirallié's De l'Aphasie Sensorielle (Sensory Aphasia), 492.
 Moullin's Treatise on Surgery, 79.
 New York Eye and Ear Infirmary Reports, vol. iv., Part I., 528.
 Phillips's Spectacles and Eye-Glasses: their Forms, Mountings, and Proper Adjustment, 81.
 Physician's Visiting List for 1897, 739.
 Presbyterian Eye, Ear, and Throat Charity Hospital Reports, 238.

Reviews:

- Presbyterian Hospital in the City of New York, Annual Medical and Surgical Report of, 527.
- Purdy's Practical Urinalysis and Urinary Diagnosis, 538.
- Roth's Modern Materia Medica, 238.
- Singer's History of Prostitution, 610.
- Sée's Le Gonococque, 812.
- Shoemaker's Practical Treatise on Materia Medica and Therapeutics, 310.
- Snell's Eyesight and School Life, 306.
- Starr's Diets for Children, 611.
- Sternberg's Text-Book of Bacteriology, 613.
- Stoney's Practical Points in Nursing, for Nurses in Private Practice, 536.
- Taylor's Pathology and Treatment of Venereal Diseases, 311.
- Thompson on Röntgen Rays and Phenomena of Anode and Cathode, 813.
- Tiffany's Anomalies of Refraction of the Muscles of the Eye, 237.
- Transactions of the Colorado State Medical Society, 80.
- Tubby on Deformities: A Treatise on Orthopædic Surgery, 741.
- Veasey's Ophthalmic Operations as Practised on Animal's Eyes, 814.
- Wharton's Minor Surgery and Bandaging, 812.
- Wilson's American Text-Book of Applied Therapeutics, 815.
- Yeo's Food in Health and Diseases, 740.
- Rheumatism and allied affections, local hot-air treatment in, 512.
- Rheumatoid arthritis, bacteriology of, 340.
- Riggs, C. Eugene, M.D., the spinal cord in a case of pernicious anæmia, **497**.
- Robertson, J. Steele, what Australians die of, **22**.
- Robinson, W. D., M.D., mechanical water-filters, **551**.
- Röntgen's discovery, **1**, 239.
- rays in ocular surgery, 673.
- S.**
- Sailer, Joseph, M.D., Review of Medicine, 43, 118, 214, 258, 339, 406, 465, 579, 663, 718, 802.
- Saliva, importance of the, in gastric digestion, **425**.
- Salol in osseous tuberculosis, 356.
- Sanitary reform, danger to the cause of, 366.
- Saturnine intoxication, 482.
- Scabies, 134.
- Scarlatina, treatment of, by antistreptococci serum, 221.
- Scleroderma, 591.
- Scopolamine intoxication, 152.
- Scott, J. A., A.M., M.D., Review of Medicine, 43, 418, 214, 258, 339, 406, 465, 579, 663, 718, 802.
- Seiler, Carl, M.D., remarks on perforation of the nasal septum, **333**.
- Septic peritonitis, 285.
- Serpent's venom, immunization against, 468.
- Serum of highly immunized animals, on a special action of the, 606.
- therapy for syphilis, 53.
- treatment of diphtheria in 1895, result of at the Kronpritz Rudolf-Kinderspitale, 467.
- Simple serous recurrent pleural effusion, its final outcome, **109**.

- Skiagraphy of the head and trunk, **319**.
- Skin, absorption of drugs by the healthy, 350.
- affections of the, occurring in the course of Bright's disease, 124.
- Skin-diphtheria, 45.
- Small-pox and vaccinia, 348.
- hospital burned by a mob, 239.
- Smith, Allen J., A.M., M.D., Review of Pathology, 74, 152, 295, 365, 419, 484, 606.
- Lawrence S., A.B., M.D., Review of Obstetrics and Gynæcology, 69, 284, 596, 672, 730.
- Society of Medical Phonographers, 679.
- Spastic paraplegia, family form of, 590.
- Spiller, William G., M.D., traumatism and hæmatomyelia as causes of syringomyelia, **193**.
- Review of Neurology, 64, 144, 229, 288, 360, 415, 478, 518, 590, 669, 723, 804.
- Spinal caries, detection of, by the Röntgen process, 477.
- Spinal cord in a case of pernicious anæmia, **497**.
- primary combined systemic disease of the, 289.
- tumor of the, 230.
- Spleen in the infectious diseases, 301.
- Splenomegaly, primary, primary carcinoma of the spleen, 420.
- Spontaneous sphacelus, changes of the nerves in, 296.
- Sporadic cretinism and its treatment, 720.
- State medical examinations in New York, 87.
- Steele, J. D., M.D., a case of aneurism of the abdominal aorta, with thrombosis of the right renal artery, **506**.
- Stelwagon, Henry W., M.D., barber's itch, **40**.
- Stockton, Charles G., M.D., cystitis, **36**.
- Stomach, diagnosis of changes in, 120.
- dilatation of the, **246**.
- Streptococcus and its toxins, action of, 522.
- Strumitis, acute, caused by the diplococcus of Fränkel-Weichselbaum, 410.
- Subconjunctival ecchymoses, treatment of, by eserine, 673.
- Subconscious fixed idea, 292.
- Sudden death from occlusion of the coronary arteries, 297.
- Sugar-testing in the urine, on the verification of, 301.
- Suprarenal capsules, functions of the, 119, 217.
- extract in Addison's disease, **3**.
- physiological action of, 261.
- Surgery before the days of anæsthesia, **546**.
- Susceptibility and immunity, **330**.
- Syphilis, congenital, of the liver in the newborn, 259.
- experiments with serum therapy in, 260.
- genesis of hereditary, 258.
- pathognomonic symptoms of congenital, 339.
- the hæmotherapeutics of, 259.
- the healing properties of erysipelas in, 260.
- Syphilitic disease of the brain and skull, **89**.
- Syringomyelia, **617**, **681**, **745**.
- cavity formation in the medulla oblongata and the anatomical bulbar lesions in, 478.
- traumatism and hæmatomyelia as causes of, **193**.

T.

- Tabetic amyotrophy, 593.
- Taylor, A. E., M.D., a case of congenital absence of both radii, **89**.
- a case of syphilitic disease of the brain and skull, **89**.

Taylor, John Madison, M.D., children of feeble resistance; their care and management, **439**.
 Temperature curve in phlegmons, 54.
 in the diagnosis of chronic tuberculosis, importance of frequent observation of, 47.
 Tetanus following abortion, treated by antitoxin, 128.
 toxine, spinal lesions caused by, 519.
 Theobromine, 351.
 Therapeutics, new and old, 584.
 Thomas, J. D., M.D., internal and external urethrotomy, **251**.
 Thrombosis of the abdominal aorta, 663.
 of the cerebral sinuses, infective, 60.
 Thyms gland, cyst-formation in, 75.
 Thyroidine, occurrence of, in the human body, 580.
 Thyroid extract in goitre, 354.
 in insanity, 270.
 Thyroidine, 268.
 Tissue metamorphosis in acute yellow atrophy of the liver, 410.
 Tongue, hemiatrophy of, 671.
 Toxines of the streptococcus of erysipelas and bacillus prodigiosus in the treatment of inoperable malignant tumors, 586.
 Traumatism as a cause of gastric disease, 465.
 Trichophyton fungus, 486.
 Trigemini paralysis, isolated total right-sided, 290.
 Tuberculosis in valvular lesions of the heart, 265.
 of the female genital organs and of the kidneys, **336**.
 of the hip-joint, 137.
 Tumor, cerebral, in a hemianæsthesia, 68.
 of the cerebellum, in which operation was rejected, 594.
 of the pituitary body, 360.
 Tumors, cystic, of the uterine adnexa, pathology of, **243**.
 Tunica vaginalis, calcification of, as a complication of old hydrocele, orchidomeningitis calcificans, 61.
 Tunis, Joseph P., A.B., M.D., Review of Surgery, 53, 137, 225, 273, 358, 413, 474, 517.
 Tussey, A. Edgar, M.D., redundancy of respiratory surface, **30**.
 Typhoid fever, early diagnosis of, by bacteriological examination of the dejecta, 263.
 laryngeal paralysis in, 121.
 Tzetzé fly, 365.

U.

Urethrotomy, internal and external, **251**.
 Uric acid diathesis and its effect upon the upper respiratory tract, **573**.
 Uterine mucosa, changes in the, after castration, 731.
 Uterus, new methods of vaginal antefixation of the, 285.

V.

Vaccination, accidents of, 349.
 and small-pox statistically considered, 350.
 compulsory, from a legislative point of view, 349.
 Vaccine and variolous materials, composition and action of natural and cultivated, 348.
 Vagina, ingenious restoration of the, 597.
 Vaginal hysterectomies, clinical results of nearly five hundred, 731.
 Vanderbilt University, 88.
 Vander Veer, Albert, M.D., tuberculosis of the female genital organs (including tuberculosis of the kidneys), **336**.
 Vasomotor edema without albuminuria, 407.
 Veins of the head and neck, **708**.
 Vermiform appendix, congenital absence of, 75.
 Vertebral column, tumor of, 66.
 Vertigo, laryngeal, **325**.
 Visiting list of a physician as evidence in support of his claim for professional services, 367.

W.

Wandering spleen, treatment of, by splenorrhaphy, 274.
 Wathen, William H., M.D., the pathology of cystic tumors of the uterine adnexa, **243**.
 Weak foot, a study of the, 225.
 Weigert's new method of staining the neuroglia, 154, 238.
 Wharton, Henry R., M.D., Review of Surgery, 53, 137, 225, 273, 358, 413, 474, 517.
 What our Presidents died from, 314.
 Whole duty of the surgeon, 358.
 Word-deafness, pure, 671.

X.

X-rays, application of, to the diagnosis of Morton's painful affection of the foot, or metatarsalgia, **322**.







